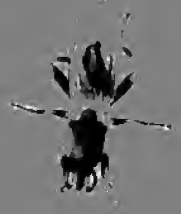
RECORDS OF THE AUSTRALIAN MUSEUM

Volume 71 Number 3 12 June 2019

Review of the Species of *Paranomina* (Diptera: Lauxaniidae)

❖

The Genus *Pseudopomyza* (Diptera: Nerioidea) in Tasmania, with Description of a New Species



❖

Review of the Australian Signal Flies of the Genus *Microepicausta* (Diptera: Platystomatidae)

by

David K. McAlpine

David K. McAlpine Bibliography from 1952 to the Present

by

Russell Cox and Shane F. McEvey

Volume 71 Number 3

Published (print and online) 12 June 2019

Price: AU$50.00

Printed by Rodenprint Pty Ltd, Sydney

ISSN 0067-1975 (print)

ISSN 2201-4349 (online)

The Australian Museum is a statutory authority of, and principally funded by, the NSW State Government.

Cover image: Upside Down Flies of the family Neurochaetidae McAlpine 1978 have the curious habit of facing downwards and walking sideways and backwards. "Populations of *Neurochaeta inversa* McAlpine 1978 have always been found in association with the araceous plant *Alocasia macrorrhizos* (Linné) G. Don (known as Cunjevoi or Spoon Lily), growing in its original habitat. The flies have not yet been found on cultivated examples, which are common in Sydney gardens. So far they have not been found on any other plant, even as a casual visitor, despite much sweeping of vegetation for insects near the *Alocasia*. The life cycle is ... intimately connected with this plant ... (McAlpine, 1978:291; all of McAlpine's peer-reviewed publications are listed in this issue).

The Australian Museum houses some of the world's most important collections of Australian animal, fossil and geological specimens and cultural objects. Research on these millions of specimens and artefacts yields insights into how our world changes through time and how its diversity can be classified, interpreted and appreciated. This knowledge, when shared among the scientific and broader community — initially through publication — helps us understand the significance of the impact we have on our environment. The collections represent key research infrastructure that will have increasingly significant value through the rest of this century and into the future. From this resource, we come to know what reasonable steps society can take now for the well-being of future generations. Our responsibility is also to inspire the exploration of nature and cultures; our vision is a beautiful and sustainable natural world with vibrant and diverse cultures that we are able to see, appreciate and know deeply.

Since 1827, the results of studies on Australian Museum collections, or studies that more generally lead to a better understanding of nature and cultures in Australia and the Pacific, have been published by the Museum. Our leading science journal, *Records of the Australian Museum*, was first published in 1889. In 1999 we began releasing PDF of published articles through our open access website. In 2008 we adopted DOI registration for our online content to facilitate persistence and cross-linking in the scientific literature. In 2009 we digitized, articalized and DOI-registered the entire legacy of all science published by us since 1851, and made that huge searchable resource permanently and freely available online. Since 2016 authors are ORCID-registered. Since 2017 articles are ZooBank registered. PDF are externally archived at the National Library of Australia (NLA from 2018), and from 2019 works are licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0). To accelerate publication of peer-reviewed science we adopted (from volume 65, 2014) a one- or several-article per publication model and we are limiting, but not abandoning, print production. There were six issues published in 2017, five in 2018. All that is published in print is immediately and freely available online.

Authors are invited to submit manuscripts to the Editor. Manuscripts meeting subject and stylistic requirements outlined in the *Instructions to Authors* (see inside back cover) are peer-reviewed by external referees to meet standards of excellence set by the Editorial Board.

https://doi.org/10.3853/issn.2201-4349

Records of the Australian Museum is covered in the Thomson Reuters Scientific services: Current Contents / Agriculture, Biology, and Environmental Sciences, and Science Citation Index Expanded (also known as SciSearch®)

We promote cross-linking in the scientific literature by using DOI for all Australian Museum scientific publications, article-by-article back to 1889. Metadata in CrossRef and from 2017 also in ZooBank. PDF is externally archived at NED (Australian National edeposit from 2018). Authors are ORCID registered.

Records of the Australian Museum (2019)
vol. 71, issue no. 3, pp. 71–85
https://doi.org/10.3853/j.2201-4349.71.2019.1655

Records of the Australian Museum
a peer-reviewed open-access journal
published by the Australian Museum, Sydney
communicating knowledge derived from our collections
ISSN 0067-1975 (print), 2201-4349 (online)

Review of the Species of *Paranomina* (Diptera: Lauxaniidae)

David K. McAlpine

Australian Museum Research Institute,
Australian Museum, 1 William Street, Sydney NSW 2010, Australia

Abstract. Review of species level taxonomy in the endemic Australian genus *Paranomina* Hendel has become possible through study of the type material of the type species, *P. unicolor* Hendel, and review of the claimed type locality for that species. The following new species are described: *Paranomina nodosa, P. hendeli, P. danielsi, P. stuckenbergi, P. martini*, *P. mouldsorum, P. dayi, P. longa*. There is evidence that most species of *Paranomina* are consistently associated with plants of the endemic Australian genus *Xanthorrhoea* (family Xanthorrhoeaceae).

Introduction

Though many Australian species of Lauxaniidae have been described, taxonomic coverage of these is still very incomplete and outdated, except for those genera treated by Kim (1994). The latter work includes the genera often placed in the subfamily Homoneurinae (e.g., by Stuckenberg, 1971). The generic and higher classification remains a matter of difficulty for the rest of the Australian lauxaniid fauna. *Paranomina* shows at least a slight morphological resemblance to the widespread but perhaps not very coherent genus *Trigonometopus* Macquart. Papp (2007) recognized a tribe Trigonometopini for this and several apparently related genera, but did not mention *Paranomina*. Although *Paranomina*, as an endemic Australian genus, can be morphologically defined, I am unable to determine its most likely relationships.

The known Australian taxa of Lauxaniidae (formerly called Sapromyzidae) were catalogued by Evenhuis and Okadome (1989), but this preceded publication of Kim's work.

Paranomina is one of numerous Australian taxa of insects associated with the endemic Australian plant genus *Xanthorrhoea* (family Xanthorrhoeaceae). Other definitely associated dipterous genera include *Octarthria* Brauer (syn. *Ophiodesma* White, family Stratiomyidae; see particularly Fuller, 1934), *Lenophila* Guérin-Méneville (syn. *Celetor* Loew, family Platystomatidae; see McAlpine and Kim, 1977), and *Nothoasteia* Malloch (family Neurochaetidae; see McAlpine, 2011). Ferrar (1987, or perhaps correctly, 1988: pp. 203, 706) mentions and illustrates the puparium of *Paranomina* sp. attached to a "grass blade". Examination of the illustration (figs 43.77, 43.78) seems to confirm this to be really on a *Xanthorrhoea* leaf. As *Xanthorrhoea* plants often occupy a prominent position among native vegetation, it is possible that many other dipterans collected from the foliage or inflorescence may have only a casual association with these plants.

In listing material, the following collectors' names are abbreviated to the initials: D. H. Colless, A. Daniels, G. Daniels, B. J. Day, G. A. Holloway, D. K. McAlpine, S. F. McEvey, B. J. Moulds, M. S. Moulds, A. J. Nicholson, M. A. Schneider.

The following abbreviations refer to institutions holding collections:

Keywords: *Paranomina*; Lauxaniidae; Diptera; taxonomy
Taxonomic registration: (LSID publication) http://zoobank.org/42B24AEC-FB7A-4C28-B978-9E956B66DCD4
Received: 3 December 2015 **Accepted**: 11 April 2017 **Published**: 12 June 2019 (in print and online simultaneously)
Publisher: The Australian Museum, Sydney, Australia (a statutory authority of, and principally funded by, the NSW State Government)
Citation: McAlpine, David K. 2019. Review of the species of *Paranomina* (Diptera: Lauxaniidae). *Records of the Australian Museum* 71(3): 71–85.
https://doi.org/10.3853/j.2201-4349.71.2019.1655

AM Australian Museum, Sydney
ANIC Australian National Insect Collection, Canberra
MV Museum Victoria, Melbourne
NMW Natural History Museum, Vienna
QM Queensland Museum, Brisbane
SAM South Australian Museum, Adelaide

Systematics

Genus *Paranomina* Hendel

Paranomina Hendel, 1907: 231; 1908: 58–59 (more detailed description). Stuckenberg, 1971: 544, 546.

Type species (original designation): *Paranomina unicolor* Hendel.

The genus is distinguished from other Australasian genera of Lauxaniidae by the following combination of characters: costa with series of short, stout black spinules, becoming distally replaced by finer spinules or hairs well before end of vein 3 (or R_{4+5}), in contrast to *Homoneura* van der Wulp etc.; vein 2 on most of its length not closely approximated to costa, in contrast to *Depressa* Malloch spp. and *Steganopsis* de Meijere spp.; presutural (or posthumeral) bristle of thorax absent, in contrast to condition in *Trigonometopsis* Malloch spp. etc.; anterior one, of two pairs of fronto-orbital bristles, strongly incurved and not reclinate.

Additional significant features of *Paranomina* include the following:

Head: eye rounded in profile, not higher than long; postfrons anteriorly with few inconspicuous setulae which are not distinctly proclinate; fronto-orbital plates not sharply distinct in colour or texture, but sometimes with imperfect indication of colour differentiation; face almost flat, receding ventrally in profile; its surface almost evenly pruinescent (microtrichose); cheek region with a series of large posteroventral bristles, much diminishing in size anteriorly; prelabrum (*sensu* Hendel, or anteclypeus sensu Crampton, 1942; "clypeus" as error in homology of some modern authors, see McAlpine, 2007) very narrowly transverse; palpus rather small and slender, setulose; proboscis rather short, with broad labella; antenna approximately porrect, with segments 1 and 2 short but prominent, segment 3 bilaterally compressed, ovate, less than twice as long as deep; arista with segment 4 very short, segment 5 subcylindrical, less than twice as long as its greatest diameter, segment 6 filiform, with short moderately dense black pubescence (erroneously stated to be bare by Hendel and by Stuckenberg).

Thorax slightly elongate, not strongly convex in dorsal profile; dorsocentral bristles usually 0+3 (1+3 in one species); usually one pair of acrostichal bristles and two or four longitudinal series of small acrostichal setulae; scutellum with two pairs of bristles and no setulae; humeral, propleural (proepisternal), and mesopleural (anepisternal) bristles one each; postsutural intra-alar bristle absent, in contrast to *Minettia* Robineau-Desvoidy; sternopleural bristles usually two, of unequal size; pteropleuron bare; prosternum broad, bare, without precoxal bridge. Fore femur with several large posterodorsal and posteroventral bristles; each tibia with one preapical dorsal bristle; fore tibia with variably developed ventral subapical bristle; hind tibia with one very short apical anteroventral spur and several smaller terminal ventral setulae. Wing generally typical of family, moderately elongate, hyaline, without darker markings.

Preabdomen without distinctive features; female postabdomen with tergites and sternites separate and relatively short; male postabdomen approximately symmetrical, its apparent surstyli completely fused to epandrium (surstylar lobes of Papp, 2007).

Examples of *Paranomina* can be generically identified by use of the key to the Old World lauxaniid genera given by Stuckenberg (1971), but not by Malloch's key to the Australian genera of "Sapromyzidae" (1927: 400), which requires the correction added by Malloch (1928:30). Two undescribed lauxaniid species from South Australia (in AM collection) somewhat resemble *Paranomina*, but have a large presutural bristle and the eye is slightly higher than long. The generic position of these species will need to be determined when there is better study material available.

Monophyly of the genus *Paranomina* is supported by the absence of the presutural bristle and the strong incurvature of the anterior fronto-orbital bristle, both apparently somewhat unusual (but not unique) apomorphic conditions within the Lauxaniidae; together with detailed agreement in most other features of external morphology. The association of the species with plants of the endemic Australian genus *Xanthorrhoea* seems to add further evidence of close relationship among the species, though this probably does not apply to *P. longa*, a species which is also slightly morphologically atypical.

Key to species of *Paranomina*

1 Dorsocentral bristles four pairs; eye in profile markedly longer than high ..... *longa* sp. nov.

—— Dorsocentral bristles three pairs; eye not or only slightly longer than high 2

2 Femora largely dark brown to black, with yellowish apices; mesopleuron (anepisternum) with large dark brown zone ..... *dayi* sp. nov.

—— Femora almost uniformly tawny-yellow; mesopleuron without dark brown zone (further species distinguished mainly by male postabdominal features) 3

3 Humeral (postpronotal) callus yellowish, with dark brown spot on lower part not extending on to mesopleuron (Fig. 19); male: each lateral rod of aedeagus with pair of apical teeth, one laterally flexed and one shorter and distomedially inclined (Fig. 21) ..... *mouldsorum* sp. nov.

—— Humeral callus without such isolated dark brown spot (sometimes shaded with grey or grey-brown below, this coloration extending on to mesopleuron); male: lateral rod of aedeagus not thus flexed apically; females not identifiable from key characters 4

4 Distal part of surstylus with two or three prominent rounded tubercles (e.g., Figs 2, 6, 7) 5

—— Distal part of surstylus without such prominent tubercles 6

5 Distal part of surstylus complex: lateral tubercle extremely posteriorly prominent (externally conspicuous in whole dry specimens—Fig. 9); medial tubercle with double prominence; separate anterior tubercle inwardly prominent, with membranous sac-like distal extension, its surface smooth except for sparse sensilla; each aedeagal rod subapically with broadly rounded expansion; South Australia ..... *nodosa* sp. nov.

—— Distal part of surstylus less complex: lateral tubercle less posteriorly prominent but variable; medial tubercle without double prominence, sclerotized and densely micropubescent; aedeagal rod not thus broadly expanded near apex; southern Queensland, New South Wales, western Victoria, Tasmania ..... *unicolor* Hendel

6 Surstylus with almost straight lateral outline and straight to slightly concave, oblique distal outline (Fig. 15); aedeagal rod with acute lobe near mid-length, beyond lobe slender, almost straight, tapering to very narrow simple apex (Fig. 16); New South Wales ..... *stuckenbergi* sp. nov.

—— Surstylus and aedeagal rod not as above 7

7 Surstylus (posterior view) distally broadly swollen (Fig. 13); aedeagal rod as in Fig. 14 ..... *danielsi* sp. nov.

—— Surstylus not thus swollen; aedeagal rod otherwise 8

8 Coloration of thorax variable, but often (in specimens from New South Wales) humeral callus shaded with grey-brown on ventral part and sternopleuron extensively grey-pruinescent; male: surstylus apically somewhat narrowly rounded (Fig. 10); paired basal hypandrial sclerites strictly transverse (Fig. 11); aedeagal rod not bilaterally compressed ..... *hendeli* sp. nov.

—— Entire humeral callus and thoracic pleura tawny-yellow; male: surstylus apically partly subtruncate (Fig. 17); basal sclerites of hypandrium oblique; aedeagal rod distally broadly compressed in almost vertical longitudinal plane and curved anteriorly ..... *martini* sp. nov.

Paranomina unicolor Hendel

Figs 1–4

Paranomina unicolor Hendel, 1907: 231; 1908: pl. 1, figs 4, 5.

Type material examined. Holotype ♂. Queensland: "Thorey 1868 Cap York" [sic] (NMW). In good condition, on long, slightly bent pin. Given type locality now deemed to be erroneous (see below).

Other material examined (morphologically typical males, localities only given). Queensland: Bunya Mountains (AM). New South Wales: West Head, Ku-ring-gai Chase National Park, near Sydney (AM); Royal National Park, near Sydney (AM, QM); Currarong, near Jervis Bay (AM, QM); Gibraltar Range National Park, W of Grafton (AM); 10 km NE of Tuglo, Singleton district (AM).

Less typical material examined. Victoria: Mount William, Grampians Range (AM). Tasmania: Mount William National Park and vicinity (QM); 3 km S of Tomahawk, 40°52'S 147°45'E (QM); near Barnes Bay, Bruny Island (AM).

Description (male). Agreeing with generic description in general characters.

Coloration generally tawny-yellow. Parafacial with pale

Figure 1. *Paranomina unicolor* Hendel, holotype male, before dissection of abdomen.

pruinescence. Antenna dark brown to blackish. Thorax without darker markings. Tarsi usually not darkened distally. Wing hyaline; halter pale tawny. Abdomen usually tawny, sometimes partly discoloured in dried specimens.

Postabdomen (New South Wales populations). Each sclerite of sternite 6 elongate, oblique; surstylus (Fig. 2) rather large, elongate, with two large, rotund terminal tubercles, the lateral one dorsally (or externally) prominent, the medial one terminally prominent and slightly smaller, also a less conspicuous broader ventral (or inner) terminal prominence; aedeagal rod (Fig 3) complex, with distal section initially broad, but rapidly contracting to narrow apex.

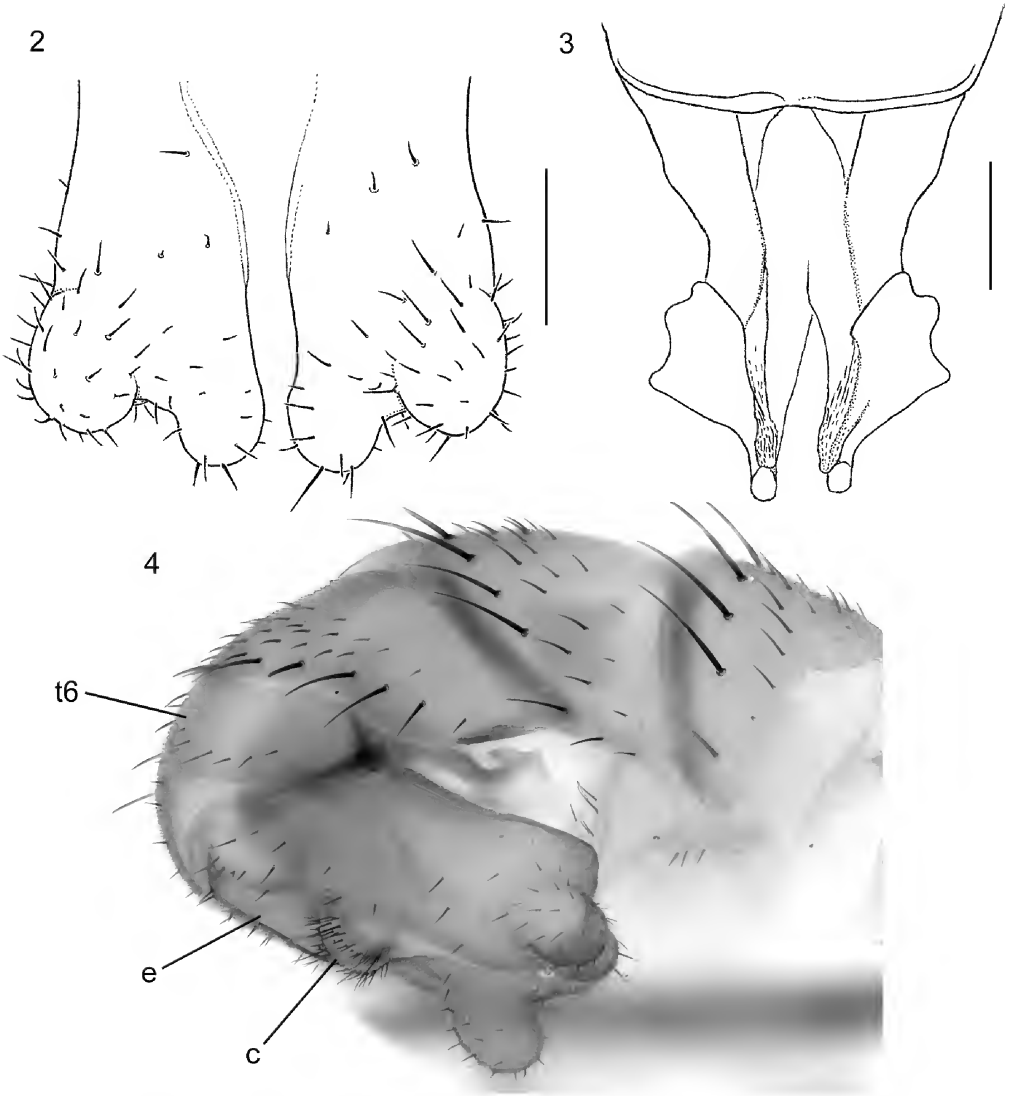
Dimensions. Total length, 4.2–5.2 mm; length of thorax, 2.0–2.2 mm; length of wing, 4.8–5.1 mm.

Distribution. 1, typical populations. Queensland: south-eastern districts. New South Wales: coastal districts. 2, Tasmanian population: eastern and southern Tasmania. 3, populations of western Victoria—status unclear.

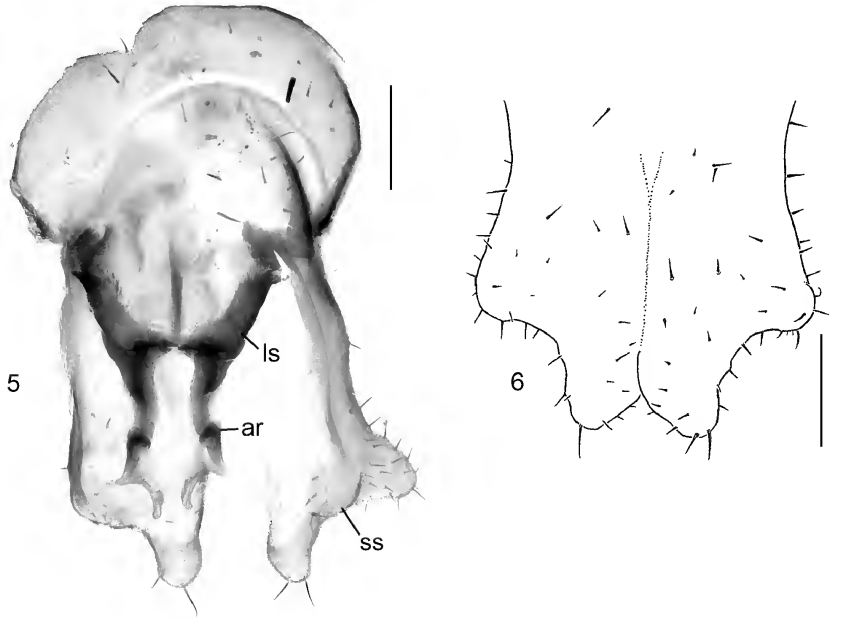
The eastern mainland populations while showing general uniformity in shape of the surstylus vary a little in details of the aedeagus, so that, even if a higher degree of uniformity is seen in the Tasmanian population, it is doubtful if that population can be considered as consistently differentiated from the eastern populations. The present unavailability of material from the greater part of Victoria adds a further element of uncertainty in differentiating these populations. Perhaps the population in the Grampians of western Victoria has the surstylus more distinctly shaped, but the two available males from this locality may not be considered adequate to demonstrate the degree of consistency. On the other hand, the related South Australian populations, here separated as *P. nodosa*, show complex and apparently consistent features of the male genitalia, which provide reasonable evidence for separate species status.

Type locality. Georg Thorey was a dealer in insect specimens based in Hamburg, Germany. He supplied a number of specimens to the Natural History Museum, Vienna, some of which became type specimens. It appears, however, that the label data "Thorey 1868 Cap York" were associated with numerous insect specimens and may have been added some time after collection. Froggatt (1909: p. 95) recorded the unreliability of these labels.

As *Paranomina unicolor* probably does not occur in the Queensland tropics, I assume the given locality "Cap York" to be incorrect, and the genitalia details of the holotype are in agreement with specimens from coastal New South Wales.



Figures 2–4. *Paranomina unicolor*, male, Royal National Park. *(2)* Surstyli, posterior (external) view, scale = 0.2 mm. *(3)* Aedeagus, anterior view, scale = 0.1 mm. *(4)* Postabdomen, right oblique lateral view. *c*, cercal complex; *e*, epandrium; *t6*, tergite 6.



Figures 5, 6. *Paranomina ?unicolor,* males of possible geographic variants. *(5)* Tasmanian variant (near Barnes Bay), anterior view of genital segment, scale = 0.2 mm. *ar*, left aedeagal rod; *ls*, left lateral sclerite of hypandrium; *ss*, left surstylus. *(6) Paranomina* sp. (Mount William, Victoria), distal part of surstyli, posterior view, scale = 0.2 mm. *ar*, left aedeagal rod; *ls,* left lateral sclerite of hypandrium; *ss,* left surstylus.

Paranomina nodosa sp. nov.

http://zoobank.org/NomenclaturalActs/FF006BA6-B6B6-499C-98AE-663AB3D2664E

Figs 7–9

Holotype ♂. South Australia: Castle Hill, Kangaroo Island [c. 35°44'S 136°57'E], 29.xi.1977, D.K.M., M.A.S. (AM K.456340). On micropin through polyporus, epandrium exposed. **Paratypes**. South Australia: 15♂♂, same data as holotype (13♂♂ AM K.515433–445, 2♂♂ SAM); 1♂, 2 km S of Willunga, Adelaide district, Nov. 1977, D.K.M., M.A.S. (AM K.515446).

Other material examined. 5♀♀, same data as holotype and probably conspecific (4♀♀AM, 1♀ SAM).

Description (male). Agreeing with generic description in general characters; slightly larger than most species.

Coloration. Largely tawny-yellow. Head: upper part of face and much of parafacial paler, often whitish; postfrons often with narrow brown suffusion on part of anterior margin. Antenna grey-brown to blackish; arista black. Prelabrum and palpus pale tawny. Thorax without darker markings; pleura with whitish pruinescence noticeable from some angles of view. Legs pale tawny; terminal tarsomere usually grey-brown. Wing: hyaline; halter tawny-yellow. Abdomen normally pale tawny, often discoloured in preserved specimens.

Postabdomen somewhat resembling that of *P. unicolor*; distal part of surstylus with major lateral tubercle extremely prominent, always externally conspicuous (Fig. 9); medial tubercle with double prominence; separate anterior tubercle prominent when dissected, with membranous, rounded, sac-like distal extension, its surface smooth, except for sparse sensilla; aedeagal rod with broadly rounded subapical expansion and narrowed apical section very short.

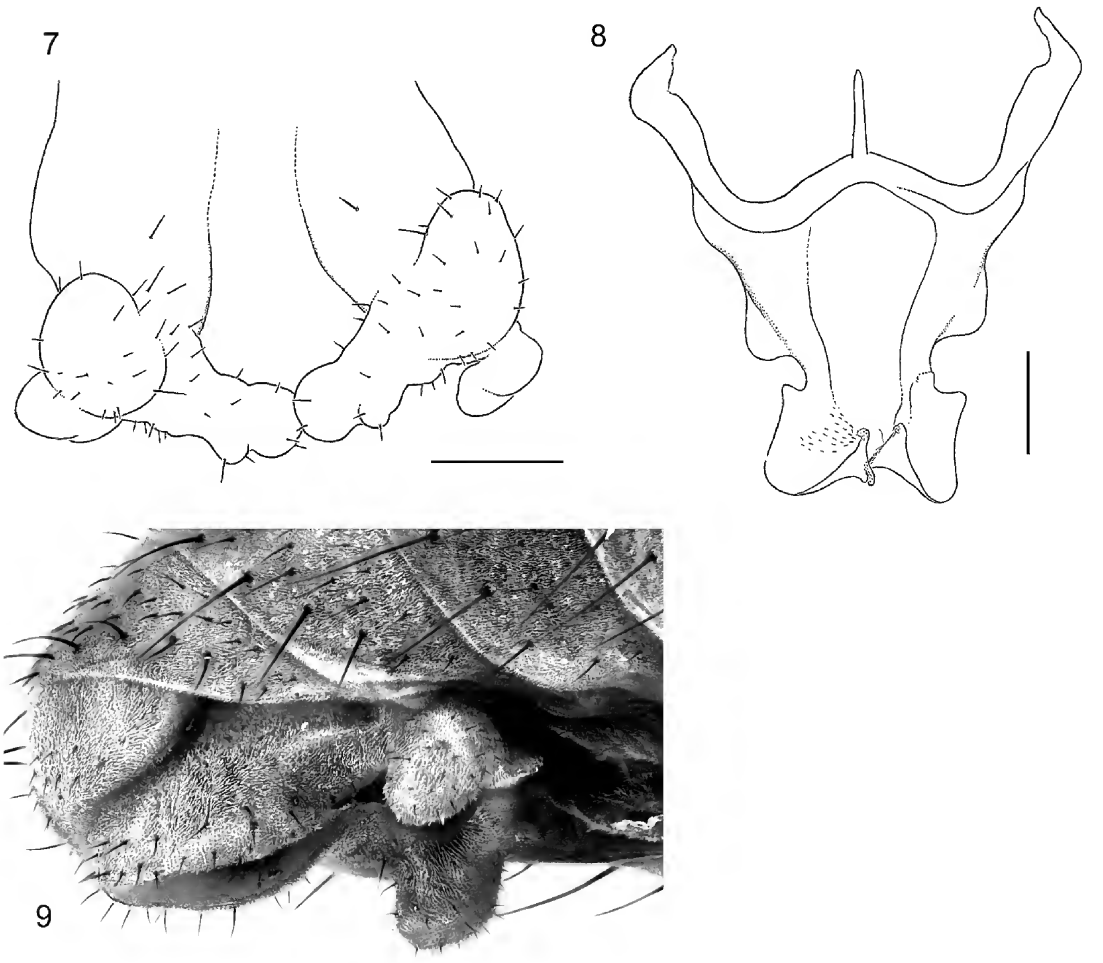
Dimensions. Total length, 4.9–5.2 mm; length of thorax, 2.1–2.4 mm; length of wing, 5.3–5.8 mm.

Distribution. South Australia: from south of Adelaide district to Kangaroo Island. *Paranomina nodosa* is the only species of the genus at present known from South Australia.

Notes. *Paranomina nodosa* is clearly related to *P. unicolor*, and, like that species, has no distinct dark thoracic markings. It averages slightly larger than most other species of the genus. The structure of the surstylus and aedeagal rod is distinctive, and the major lateral tubercle of the former protrudes conspicuously in dried male specimens.

Although label data do not include the host plant, I believe that the type material was collected from *Xanthorrhoea* sp.

The specific epithet is a Latin adjective—knob-bearing, in reference to the surstylus.



Figures 7–9. *Paranomina nodosa*, male, Castle Hill. *(7)* Surstyli, posterior view, scale = 0.2 mm. *(8)* Hypandrium and aedeagus, anterior view, scale = 0.1 mm. *(9)* Postabdomen, right lateroventral view (whole dried specimen).

Paranomina hendeli sp. nov.

http://zoobank.org/NomenclaturalActs/71CCEB73-4254-41A3-ABE1-49B495F4A848

Figs 10–12

Holotype ♂. New South Wales: Royal National Park [eastern parts, probably near Flat Rock Creek], near Sydney, 13.vii.1971, D.K.M., G.A.H. (AM K.456341). **Paratypes**. New South Wales: 105 (34♂♂ 26♀♀ in AM K.515447–506, 25♂♂ 20♀♀ in QM), Royal National Park (including Flat Rock Creek, Cascade Creek, Gundamain), v vi vii viii x xi xii.1963–1977, G.D., D.K.M.; 3 (2♂♂ 1♀ in QM), Engadine, Oct. 1977, G.D.; 11 (3♂♂ 1♀ in AM K.515507–510, 2♂♂ 1♀ in ANIC, 3♂♂ 1♀ in QM) Ku-ring-gai Chase National Park (including near Terrey Hills, McCarr's Creek, West Head), i viii ix.1960–1986, G.D., D.H.C., D.K.M.; 1♂ (ANIC), Deep Creek, near Narrabeen, xii 1961, D.H.C.; 15 (7♂♂, 8♀♀ in AM K.556212–226) Halfway Creek, 18 miles [c. 30 km] S of Grafton, v.1972, D.K.M.

Other material examined (localities only given). Queensland: 3♂♂ 1♀ (QM) Cholmondeley Creek, 11 km SW of Heathlands; 1♀ (QM) Gunshot Ck, 13 km NW Heathlands; 2♂♂ (AM) 4 miles [c. 6 km] NE of Mount Lamond, Iron Range district; 3♂♂ 2♀♀ (QM) near Coen Aerodrome; 2♂♂ (AM) Bald Hills Station, 6 km NW of Isabella Falls; 3♂♂ 3♀♀ (AM) Clohesy Road, near Kuranda; 3♂♂ 2♀♀ (AM) 9 miles N [probably more accurately 14 km NW] of Rollingstone; 1♂ 1♀ (AM) 30 miles [c. 48 km] N of Marlborough; 1♂ 1♀ (AM) Deception Bay; 1♂ (QM) Tibrogargen Ck; 1♀ (QM) Brown Lake, North Stradbroke Island; 1♂ (QM) 13 km N Dunwich, North Stradbroke Island; 1♂ (QM) Acacia Ridge.

Description (male, female). Agreeing with generic description given above; size slightly smaller than that of most *Paranomina* species.

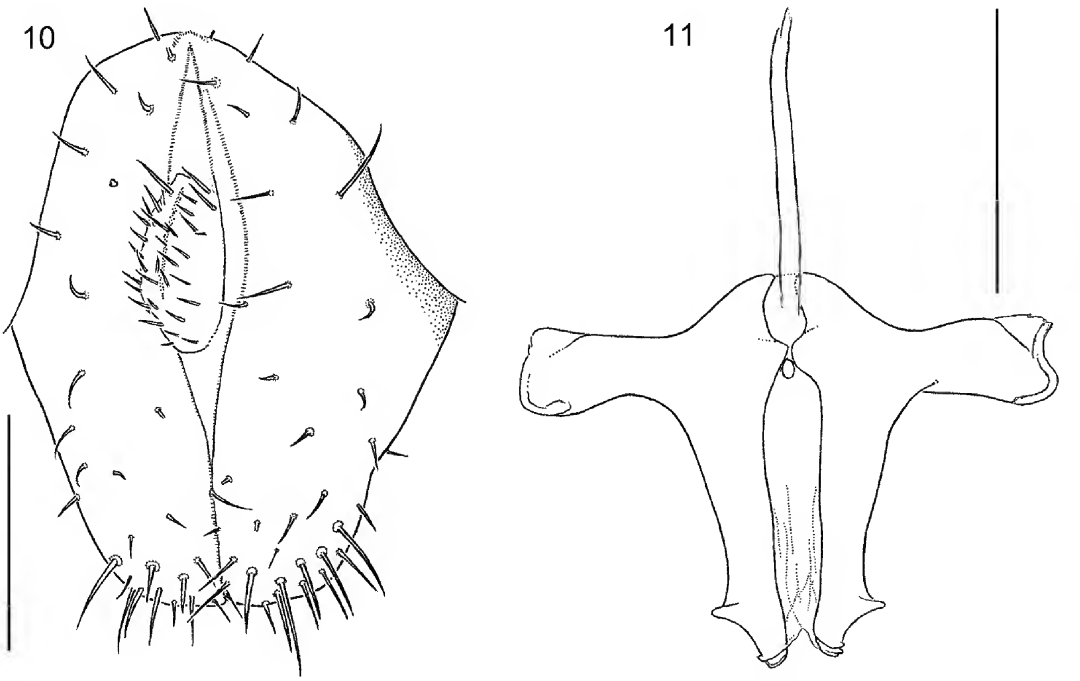
Coloration (typical New South Wales populations) generally tawny with brown tinge (a few specimens paler). Head: parafacial and anterior cheek region paler, often white to creamy. Antenna largely dark brown to greyish brown, arista blackish. Prelabrum tawny to brown; palpus brownish, often darker distally. Thorax without definite dark brown zones; mesoscutum tawny-brown, usually with pair of longitudinal tawny-yellow zones; pleura usually largely tawny brown with greyish pruinescence; humeral callus yellow to tawny yellow on c. dorsal half, becoming greyish brown below, this somewhat darker tone extending on to pleura. Legs tawny yellow. Wing hyaline to faintly smoky; halter yellow. Abdomen normally tawny-yellow, often discoloured in preserved specimens.

Head slightly shorter and more rotund in profile than that of *P. stuckenbergi* and related species; cephalic chaetotaxy typical of genus.

Thorax structurally typical of genus.

Male postabdomen (New South Wales population). Surstylar-epandrial complex somewhat smaller than in related species; surstylus distally simple in outline, slightly narrowly rounded, with rather coarse, irregularly placed setulae; paired basal hypandrial sclerites stout and strictly transverse (Fig. 11); each aedeagal rod almost straight, somewhat shorter and stouter than in related species, with stout, subterminal lateral tooth, more narrowed terminally and joined to other of its pair by transparent membrane almost to apex; aedeagal apodeme long and slender.

Dimensions. Total length, males 3.7–4.2 mm, females 3.4–4.2 mm; length of thorax, males 1.5–1.7 mm, females1.5–1.6 mm; length of wing, males 4.0–4.4 mm, females 3.9–4.2 mm.



Figures 10, 11. *Paranomina hendeli*, male, Royal National Park. *(10)* Epandrium with surstyli, posterior view, scale = 0.2 mm. *(11)* Hypandrium and aedeagus, anterior view, scale = 0.2 mm.

Figure 12. *Paranomina hendeli*, holotype male. Head and thorax.

Distribution. New South Wales: coastal districts, as far south as Royal National Park (c. 34°12'S). Queensland: eastern coastal districts, as far north as Heathlands (c. 11°45'S).

Notes. *Paranomina hendeli* is, on the average, smaller than other species of the genus, and is probably consistently smaller than *P. unicolor*. The usually more greyish toning of the thoracic pleura (at least for the non-tropical populations) is somewhat different from that of the tawny-yellow pleural coloration of the partly sympatric *P. danielsi* and *P. stuckenbergi*, and the slightly darker greyish brown shading of the ventral half of the humeral callus of *P. hendeli* is absent in those two species. This condition of *P. hendeli* is distinct from the dark brown spot on the lower part of the humeral callus present in *P. mouldsorum*. As indicated above, the form of the surstylus and the aedeagal complex enables accurate identification of males of *P. hendeli*, including those from tropical populations.

The specific epithet refers to Friedrich Hendel, the original author of *Paranomina* and basic contributor to the systematic study of Lauxaniidae and other dipterous families.

Paranomina danielsi sp. nov.

http://zoobank.org/NomenclaturalActs/5A23ED7C-380E-4BC7-A2ED-D617C2152897

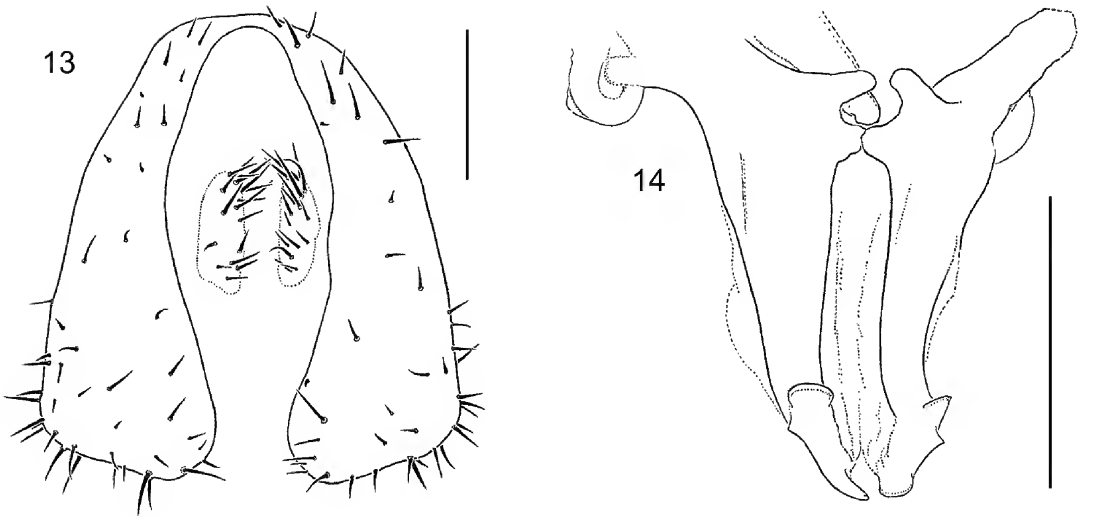
Figs 13, 14

Holotype ♂. New South Wales: Currarong, near Jervis Bay [c. 35°01'S 150°49'E], 15.xi.1970, G.D. (AM K.456342). On leaves of *Xanthorrhoea*. On micropin through polyporus, hind legs and left antenna damaged, postabdomen in microvial on main pin. **Paratypes**. New South Wales: 1♂, same data as holotype (AM); 3♂♂, Gundamain [or Gundamaian], Royal National Park, Jan. 1926, Oct. 1971, A.J.N., G.D. (ANIC, QM); 1♂, Heathcote, Nov. 1970, D.K.M. (AM).

Other material examined. New South Wales: 1♀, same data as holotype (AM), is possibly conspecific.

Description (male). Agreeing with generic description in general characters.

Coloration generally tawny-yellow. Head: without any greyish or brown zones; parafacial pale creamy to white. Antenna mainly brown to blackish, sometimes partly tawny, arista tawny, with darker apex. Thorax without darker grey-pruinescent zones on humeral callus and pleura. Legs without darker zones. Wing membrane faintly tinged with yellow; halter pale tawny. Abdomen typically pale tawny, often partly discoloured in preserved specimens.



Figures 13, 14. *Paranomina danielsi*. *(13)* Male, Currarong, epandrium with surstyli, posterior view, scale = 0.2 mm. *(14)* Male, Gundamain, aedeagal complex, anterior view, scale = 0.2 mm.

Postabdomen. Surstylus broadened and swollen distally, with distal margin slightly obliquely transverse (Fig. 13); aedeagus (Fig. 14) having each rod with sharply delimited sclerotization, broad and complex basally, slender distally, on anterior surface with preapical wedge-like tooth, smaller compressed apical tooth, and often a less marked intermediate prominence.

Dimensions. Total length, 4.0–4.1 mm; length of thorax, 1.8–1.9 mm; length of wing, 4.2–4.6 mm.

Distribution. New South Wales: coastal districts south of Sydney.

Notes. *Paranomina danielsi* has the thorax more uniformly tawny orange than is usual in sympatric southern populations of *P. hendeli*. The surstyli are broadened distally but distinctly narrowed where they merge with the epandrium, and the apical part of the aedeagal rod is slender with distinctive armature (Fig. 14).

The specific epithet refers to Greg Daniels, who has made very significant collections of *Paranomina*.

Paranomina stuckenbergi sp. nov.

http://zoobank.org/NomenclaturalActs/FCB35A58-4787-4408-B3AB-AB0439C06C30

Figs 15, 16

Holotype ♂. New South Wales: Hat Hill, near Blackheath [c. 33°37'S 150°18'E], 16.iv.1971, D.K.M. (AM K.456343). On micropin through polyporus, postabdomen in genitalia tube on same pin. **Paratypes**. New South Wales: 5♂♂, same data as holotype (AM); 1♂, Evans Lookout, near Blackheath, Nov. 1975, G.D. (QM); 1♂, 3 km S of Mount Wilson, Blue Mountains, March 1979, G.D. (AM); 1♂, near Native Dog Hill, 38 km E of Rylstone, Dec. 1977, G.D. (AM); 1♂, [Goonoo State Forest] 5 miles [c. 8 km] S of Mendooran, Sept. 1973, G.D. (QM); 2♂♂, Royal National Park, July, Nov. 1971–1975, G.D., D.K.M., G.A.H. (AM, QM); 1♂, road to Mulligan's Hut, Gibraltar Range National Park, Feb. 1982, B.J.D. (AM).

Other material examined. New South Wales: some females from above listed localities may be conspecific with associated males (AM). 1♂, Tasmania: Mount William National Park (QM).

Description (male). Agreeing with generic description given above.

Coloration generally tawny-yellow. Head: parafacial white-pruinescent. Antenna largely dark brown. Thorax without darker markings. Fore tarsus faintly browned apically. Wing hyaline; halter yellow to tawny-yellow.

Postabdomen. Sclerites of sternite 6 little developed and pigmented; surstylus (Fig. 15) with almost straight lateral outline and with distal outline oblique, straight to slightly curved; aedeagal rod with acute, usually deflexed lobe near mid-length, beyond lobe slender, almost straight, tapering to very narrow simple apex.

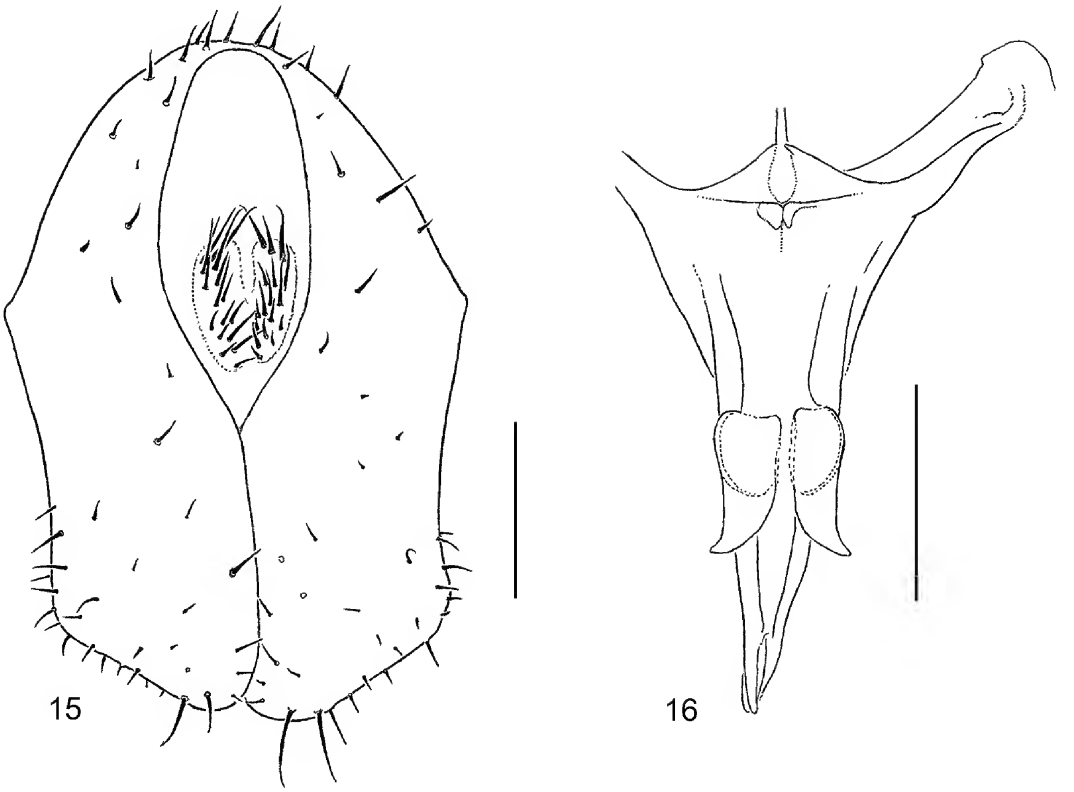
Dimensions. Total length, 4.1–4.9 mm; length of thorax, 2.2 mm; length of wing, 4.9–5.2 mm.

Distribution. New South Wales: Blue Mountains and north to ranges east of Glenn Innes; coast district just south of Sydney. Tasmania: north-east.

Notes. *Paranomina stuckenbergi* resembles *P. mouldsorum* and *P. hendeli*. It is without any distinct brown markings on the thorax, and in the male the surstylus and aedeagal rod are of characteristic shape. Females cannot be determined with certainty, though some specimens associated with males are provisionally sorted to this species.

Probably all or most of the specimens were taken on *Xanthorrhoea* plants, though few are so labelled.

The specific epithet refers to my late friend Brian R. Stuckenberg, formerly of the Natal Museum, Pietermaritzburg, who made a significant contribution to knowledge of Old World Lauxaniidae.



Figures 15, 16. *Paranomina stuckenbergi*, male, Hat Hill. *(15)* Epandrium with surstyli, posterior view, scale = 0.2 mm. *(16)* Aedeagal complex, anterior view, scale = 0.2 mm.

Paranomina martini sp. nov.

http://zoobank.org/NomenclaturalActs/4F709BBB-EB1E-4FAB-925E-17C3256E50AA

Figs 17, 18

Holotype ♂. New South Wales: Goonoo State Forest, 17 miles [c. 27 km] NE of Dubbo, 25.iii.1971, D.K.M. (AM K.456344). On leaves of *Xanthorrhoea*. On micropin through polyporus, right antenna damaged, postabdomen in microvial on main pin. **Paratypes**. New South Wales: 1♂, near Native Dog Hill, 38 km E of Rylstone, Nov. 1978, G.D. (AM); 1♂, Mount Kaputar National Park, Narrabri district, c. 900 m, Jan. 1978, G.D. (AM).

Other material examined. New South Wales: 2♀♀, from Goonoo State Forest and Native Dog Hill respectively (AM) are doubtfully referred to this species. 1♂, with same collection data as holotype, has slightly differently shaped aedeagal rods, and is considered doubtfully conspecific, in view of the paucity of study material.

Description (male). Agreeing with generic description in most characters.

Coloration generally tawny-yellow. Head: face and parafacial partly whitish-pruinescent. Antenna tawny-brown to darker brown. Palpus tawny, usually not much darker apically. Thorax without darker markings. Legs uniformly pale; tarsi not darkened distally. Wing hyaline; halter pale tawny, usually without darker markings. Abdomen tawny, sometimes partly discoloured in preserved specimens.

Postabdomen. General features as in *P. stuckenbergi*; surstylus (Fig. 17) straight, without lobes or tubercles, slightly expanded distally, but less so than in *P. danielsi*, with apical margin transverse but not straight, with slightly larger setulae; lateral sclerites of hypandrium oblique; aedeagal rod broad basally (Fig. 17), distally anteriorly curved, broadly compressed in almost vertical longitudinal plane, with small sclerotized ridge on medial surface (Fig. 18).

Dimensions. Total length, 4.5 mm; length of thorax, 2.1–2.3 mm; length of wing, 5.1–5.3 mm.

Distribution. New South Wales: mainly Western Slopes district, nearest coast record at Native Dog Hill, apparently c. 32°50'S 150°15'E. As the species has been rarely collected, its limits of distribution are probably incompletely known.

Notes. *Paranomina martini* apparently has the shape of the surstylus distinct from such related species as *P. danielsi, P. stuckenbergi* and *P. mouldsorum*. The distal part of the aedeagal rod (Fig. 18) is distinct from all other known species but may prove to be slightly variable when the species is better known.

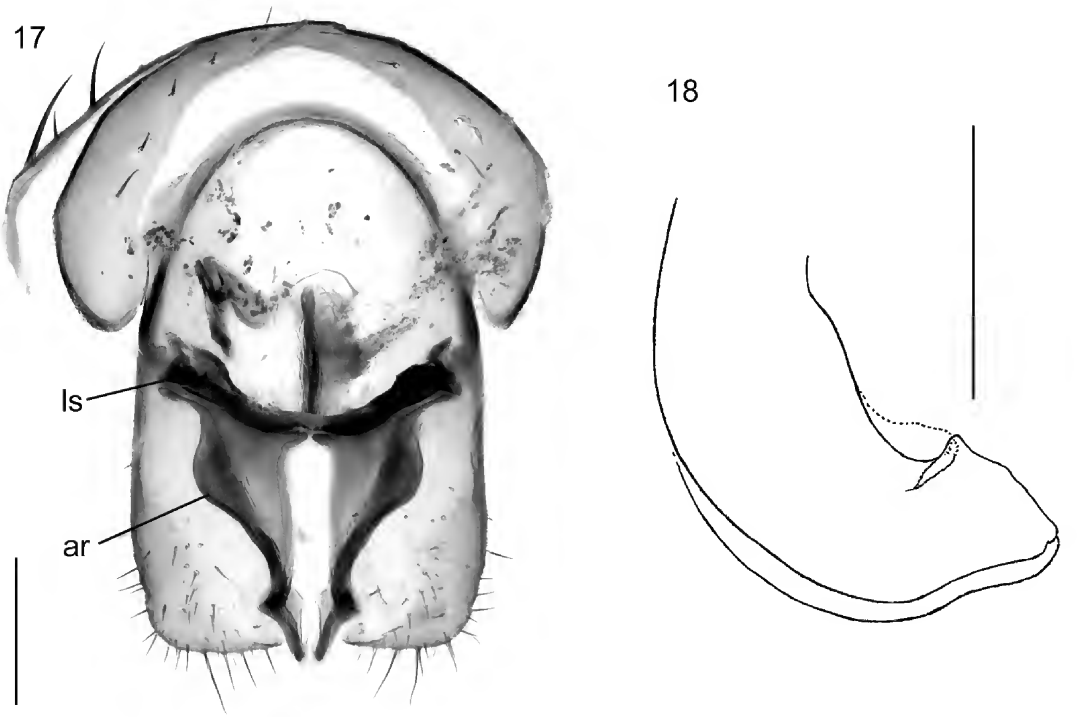
The specific name refers to John C. Martin, in recognition of help with photographic studies of *Paranomina*.

Paranomina mouldsorum sp. nov.

http://zoobank.org/NomenclaturalActs/2FB40BAE-193A-4087-98DC-19B32F2D581A

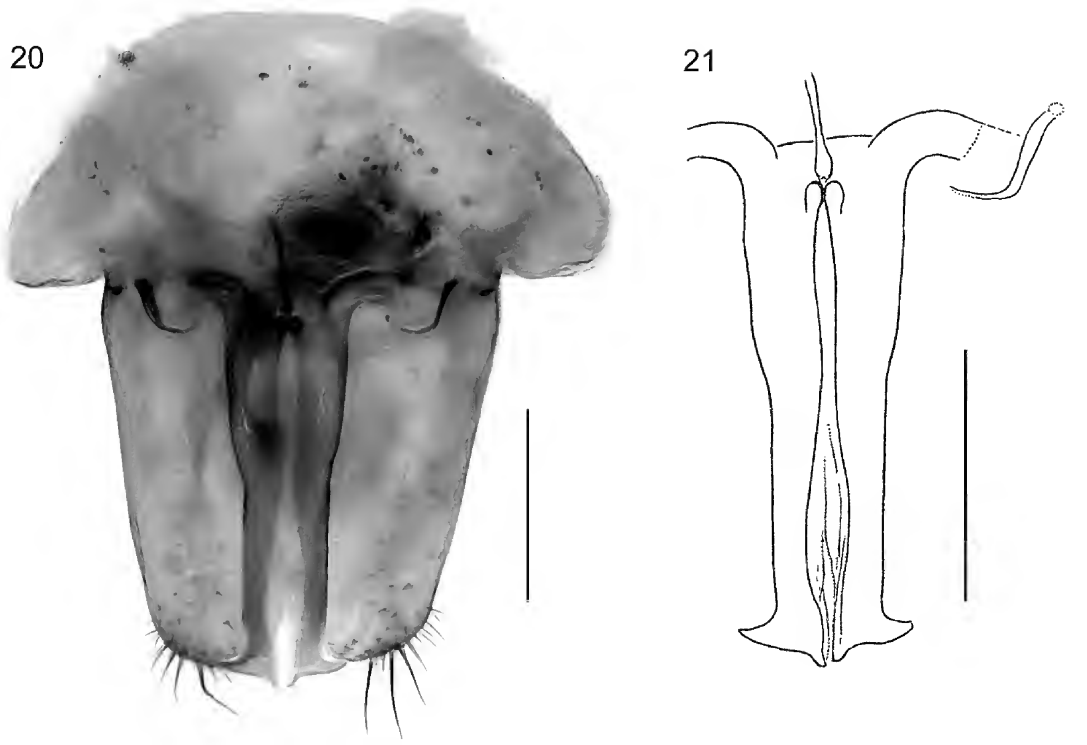
Figs 19–21

Holotype ♂. Victoria: Hall's Gap, Grampians Ranges [c. 37°08'S 142°32'E], 10.i.1976, M.S.M., B.J.M. (AM K.456345). Double mounted on micropin through polyporus; genitalia intact, partly exposed. **Paratypes**. Victoria: 6♂♂, same data as holotype (AM, MV); 1♂, Mount William, near



Figures 17, 18. *Paranomina martini*, holotype male. *(17)* Genital segment, anterior view, scale = 0.2 mm. *ls*, right lateral sclerite of hypandrium; *ar*, right aedeagal rod. *(18)* Distal part of aedeagus, right lateral view, scale = 0.2 mm.

Figure 19. *Paranomina mouldsorum*, holotype male. Head and thorax.



Figures 20, 21. *Paranomina mouldsorum*, male, Hall's Gap. *(20)* Genital segment, anterior view, scale = 0.2 mm. *(21)* Aedeagus, anterior view, scale = 0.2 mm.

summit, Grampians, Dec. 1977, D.K.M., M.A.S. (AM); 1♂, Princess Margaret Rose Caves, 8 km NNW of Nelson, Nov. 1992, M.S.M., S.F.M., D.K.M. (AM; McEvey 10750). Tasmania: 2♂♂, near Barnes Bay, Bruny Island, Dec. 1987, D.K.M. (AM).

Other material examined. Victoria: some females from Hall's Gap and Mount William (AM) are probably conspecific with the males with which they were collected.

Description (male). Agreeing with generic description.

Coloration generally tawny-yellow. Head: face and parafacial yellow to creamy. Antenna largely dark brown to blackish. Humeral callus yellow, with isolated dark brown spot on lower margin. Fore tarsus usually tawny, sometimes brown distally. Wing hyaline; halter tawny-yellow, sometimes with darker capitellum.

Postabdomen. Sternite 5 undivided; sclerite of sternite 6 little pigmented; surstylus (Fig. 20) somewhat elongate, slightly tapered distally, with rounded apex, with scattered setulae and compact sublateral apical tuft of setulae; each lateral rod of aedeagus (Fig. 21) long and almost straight, with pair of apical teeth, one acute and laterally directed and one shorter, narrow, and medially inclined.

Dimensions. Total length, 4.2–4.8 mm; length of thorax, 1.9–2.1 mm; length of wing, 4.7–5.1 mm.

Distribution. Victoria: districts W of 143°E. Tasmania: Bruny Island.

Notes. Both sexes of *Paranomina mouldsorum* can generally be distinguished from those of other species with tawny-yellow thorax and legs by the presence of a well defined dark brown spot on the lower part of the humeral callus (Fig. 19). Some specimens of *P. hendeli* have a slight brown or greyish brown suffusion in this position, but this tends to merge with the greyish pruinescence of the mesopleuron, and that species is apparently geographically separated. The apex of the aedeagal rod in the male, with pair of divergent tooth-like lobes, is also distinctive, but somewhat resembles that of *P. dayi*.

Probably all or most specimens were collected on foliage of *Xanthorrhoea*, though they are not all so labelled.

The specific epithet refers to Barbara and Maxwell Moulds, who collected most of the specimens.

Paranomina dayi sp. nov.

http://zoobank.org/NomenclaturalActs/D5B378FE-8EB5-4A75-8FE2-FD461A6BE4A5

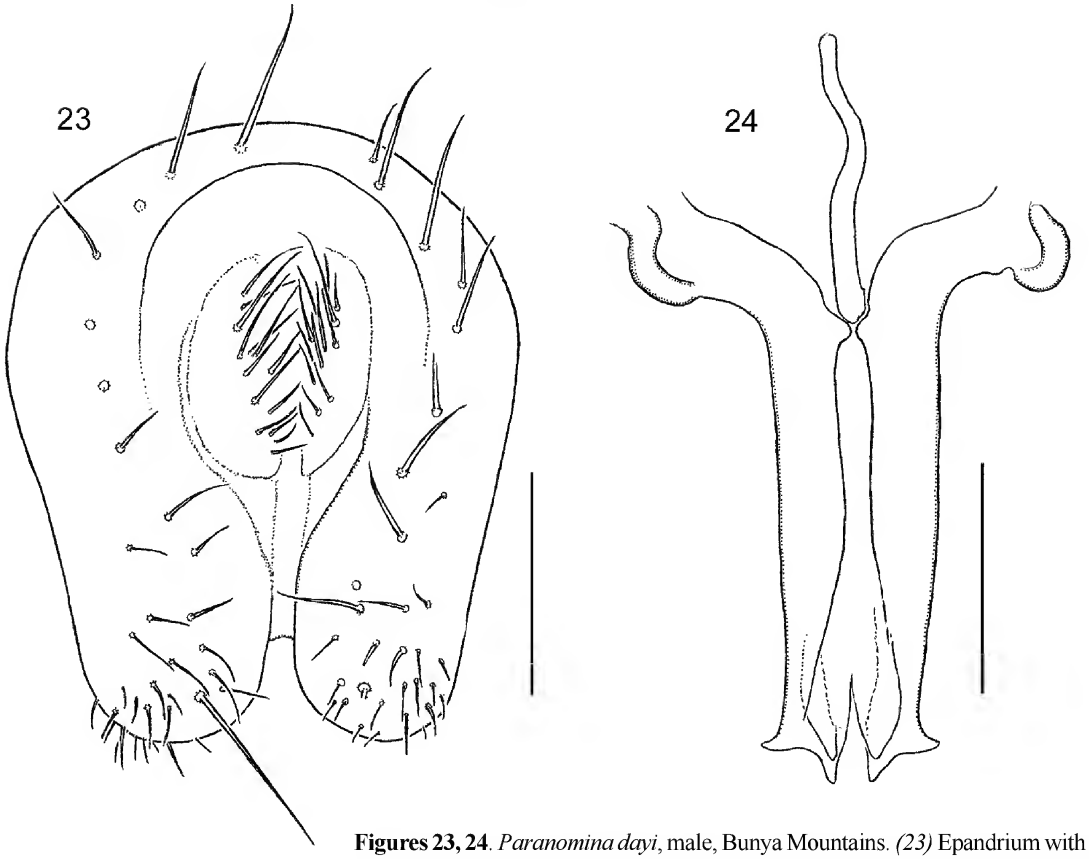
Figs 22–24

Holotype ♂. New South Wales: Gibraltar Range National Park, swamp area, 9.ii.1982, B.J.D. (AM K.456346). On leaves of *Xanthorrhoea*. On micropin through polyporus. **Paratypes**. New South Wales: 3♀♀, 10 km NW of "Tuglo", 48 km N of Singleton, 9–10 Dec. 1981, B.J.D. (AM). Queensland: 3♂♂, 2♀♀, Bunya Mountains, April 1972, G.D. (AM, QM).

Description (male, female). Agreeing with generic description, but with distinctive pigmentation of thorax and legs.

Coloration Head largely tawny to tawny-brown; face and parafacial more or less whitish-pruinescent, lower and some lateral parts of face grey-brown. Antenna tawny-brown with some grey pruinescence; segment 3 often partly darker; arista black. Prelabrum tawny-brown; palpus tawny to brown. Thorax largely tawny-brown; humeral callus blackish brown on c. lower quarter of surface; mesopleuron with dark brown zone covering anterior half and extending narrowly

Figure 22. *Paranomina dayi*, male, Bunya Mountains.



Figures 23, 24. *Paranomina dayi*, male, Bunya Mountains. *(23)* Epandrium with surstyli, posterior view, scale = 0.2 mm. *(24)* Aedeagal complex, anterior view, scale = 0.2 mm.

to posteroventral extremity; sternopleuron largely brown, with greyish pruinescence. Coxae largely tawny; femora brown-black, narrowly tawny apically; tibiae dark brown to blackish; tarsi brown. Wing hyaline; halter dull yellow. Abdominal tergites tawny-brown to dark brown.

Male postabdomen very similar to that of *P. mouldsorum* except as indicated. Surstylus on distal surface commonly with one or two larger, prominent setulae; aedeagal rod resembling that of *P. mouldsorum*, but longer relative to surstylus, with medially placed terminal tooth compressed, broadly rounded in lateral view.

Dimensions. Total length, males 4.3–5.1 mm, female 4.6 mm; length of thorax, males 2.1–2.2 mm, female 2.1 mm; length of wing, males 5.3–5.5 mm, females 4.9–5.2 mm.

Distribution. Higher rainfall areas of south-eastern Queensland and north-eastern New South Wales.

Notes. *Paranomina dayi* is readily distinguished from other species by the extensive brown-black zones on the legs, thoracic pleura, and abdominal tergites. It is closest morphologically to *P. mouldsorum*, but the tooth-like projections on the aedeagal rod differ in shape.

The specific epithet refers to Barry James Day, who collected significant material for this project.

Paranomina longa sp. nov.

http://zoobank.org/NomenclaturalActs/74237910-7955-458E-9673-A5295151DC8D

Figs 25, 26

Holotype ♂. Tasmania: Tyenna River, near [Mount Field] National Park, 400 ft [c. 122 m], 12.i.1960, D.K.M. (AM K.456347). **Paratypes**. Tasmania: 1♀, Seven Mile Beach, near Hobart, March 2005, B.J.D., D.K.M. (AM); 1♂, Mount William National Park, Jan. 1988, G.D., A.D. (QM).

Description (male, female). Agreeing with generic description in most characters, but body more elongate than in other species and head more pointed in profile.

Coloration generally tawny yellow. Head with somewhat variable brownish spot between antennal base and eye; face, parafacial, prelabrum and palpus paler yellowish. Thorax without brown markings, largely shining, with relatively slight development of pruinescence. Legs without darker zones. Wing hyaline; halter yellow. Abdomen pale tawny-yellow.

Head (Fig. 25) more acutely produced anteriorly in profile than other species of genus.

Thorax. Dorsocentral bristles 1+3, anterior one markedly anterior to transverse suture and only very slightly smaller than posterior ones; prescutellar acrostichal bristle well developed; small acrostichal setulae extensively biseriate; scutellum slightly longer than in *P. unicolor* and other species, more convexly protruding between apical pair of bristles.

Male postabdomen. Surstylar-epandrial complex (Fig. 26) more elongate than in other *Paranomina* species. with numerous scattered short setulae; each surstylus apically slightly expanded and indistinctly bilobed; aedeagus not examined in detail.

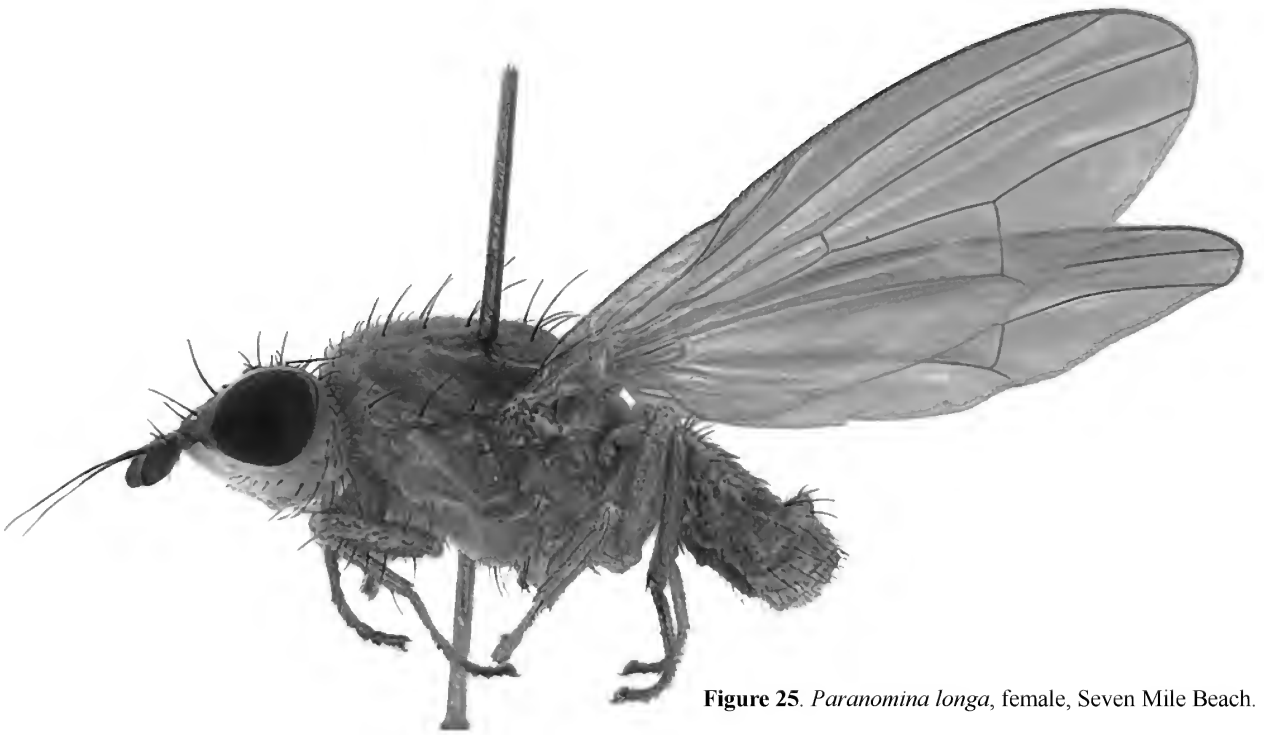


Figure 25. *Paranomina longa*, female, Seven Mile Beach.

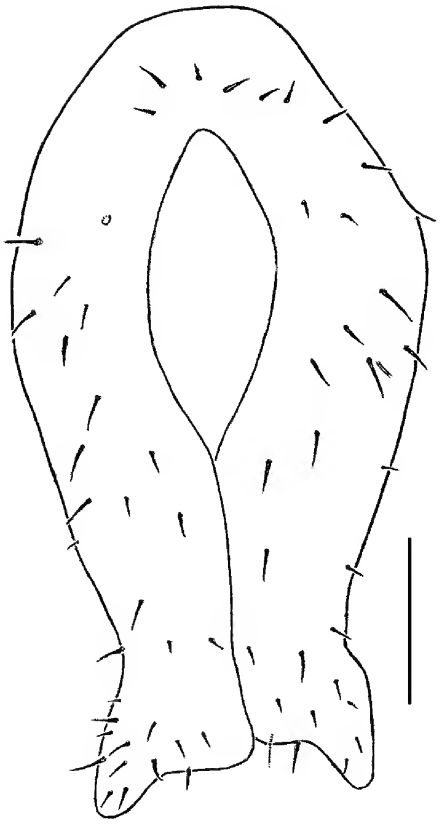


Figure 26. *Paranomina longa*, male, Mount William National Park. Epandrium with surstyli, scale = 0.2 mm.

Dimensions. Total length, males 5.1 mm, female 4.6 mm; length of thorax, males 2.0–2.1 mm, female 2.2 mm; length of wing, males 4.9–5.0 mm, female 5.3 mm.

Distribution. Tasmania: apparently widely distributed.

Notes. *Paranomina longa* differs most obviously from other species of the genus in its more elongate head and thorax and the presence of four pairs of long dorsocentral bristles, instead of the usual three pairs. In the male, the shape of the surstylus is distinctive, but the material has not proved adequate for a description of the aedeagal features.

I particularly noted that there were absolutely no plants of *Xanthorrhoea* in the habitat where I collected *P. longa* at Seven Mile Beach. It appears possible that this is the only species of *Paranomina*, if it is correctly placed in this genus, which is not closely associated with *Xanthorrhoea* species.

The specific epithet refers to the comparatively elongate head and thorax of this species.

ACKNOWLEDGMENTS. The following helped with field collection of flies from *Xanthorrhoea* plants: Greg Daniels, Barry Day, Geoff Holloway, Barbara and Max Moulds, Margaret Schneider. John C. Martin has contributed much through his work on micro-photography. Geoff Monteith, Peter Sehnal, and Jacquie Recsei arranged loan of significant material. Russell Cox, Helen Smith, and Shane McEvey helped check details for the manuscript.

References

Crampton, G. C. 1942. The external morphology of the Diptera. Guide to the Insects of Connecticut. *State Geological and Natural History Survey Bulletin* 64: 10–165.

Evenhuis, N. L., and T. Okadome. 1989. Family Lauxaniidae. In *Catalog of the Diptera of the Australasian and Oceanian Regions,* ed. N. L. Evenhuis. *Bishop Museum Special Publication* 86: 576–589.
https://doi.org/10.5962/bhl.title.49897

Ferrar, P. 1987 (1988). A guide to the breeding habits and immature stages of Diptera Cyclorrhapha, 907 pp. Leiden: E. J. Brill and Scandinavian Press.

Froggatt, W. W. 1909. Report on parasitic and injurious insects. New South Wales Department of Agriculture. Pp. 1–116, pl. 1–8.

Fuller, M. E. 1934. Notes on the genus *Ophiodesma* (Dipt., Stratiomyiidae). *Proceedings of the Linnean Society of New South Wales* 59: 421–429.

Hendel, F. 1907. Neue und interessante Dipteren aus dem kaiserl. Museum in Wien. *Wiener entomologische Zeitung* 26: 223–245.
https://doi.org/10.5962/bhl.part.8886

Hendel, F. 1908. Diptera Fam. Muscaridae, Subfam. Lauxaniinae. *Genera Insectorum* 68: 66 pp., 3 pls.

Kim, S. P. 1994. *Australian lauxaniid flies: revision of the Australian species of* Homoneura *van der Wulp,* Trypetisoma *Malloch, and allied genera (Diptera: Lauxaniidae). Monographs on Invertebrate Taxonomy* vol. 1. East Melbourne: CSIRO Australia. Pp. vii + 417.
https://doi.org/10.1071/9780643105164

Malloch, J. R. 1927. Notes on Australian Diptera, No. xiii. *Proceedings of the Linnean Society of New South Wales* 52: 399–446.

Malloch, J. R. 1928. Notes on Australian Diptera, No. xv. *Proceedings of the Linnean Society of New South Wales* 53: 319–335.

McAlpine, D. K. 2007. The surge flies (Diptera: Canacidae: Zaleinae) of Australasia and notes on tethinid-canacid morphology and relationships. *Records of the Australian Museum* 59(1): 27–64.
https://doi.org/10.3853/j.0067-1975.59.2007.1468

McAlpine, D. K. 2011. The clawless upside-down fly, *Nothoasteia clausa* (Diptera: Neurochaetidae): notes on distribution, behaviour, and comparative morphology. *Tijdschrift voor Entomologie* 154: 159–165.
https://doi.org/10.1163/004074912X13397496981346

McAlpine, D. K., and S. P. Kim. 1977. The genus *Lenophila* (Diptera: Platystomatidae). *Records of the Australian Museum* 30(13): 309–336.
https://doi.org/10.3853/j.0067-1975.30.1977.391

Papp, L. 2007. A review of the Old World Trigonometopini Becker (Diptera: Lauxaniidae). *Annales Historico-Naturales Musei Nationales Hungarici* 99: 129–169.

Stuckenberg, B. R. 1971. A review of the Old World genera of Lauxaniidae (Diptera). *Annals of the Natal Museum* 20: 499–610.

Records of the Australian Museum (2019)
vol. 71, issue no. 3, pp. 87–94
https://doi.org/10.3853/j.2201-4349.71.2019.1674

Records of the Australian Museum
a peer-reviewed open-access journal
published by the Australian Museum, Sydney
communicating knowledge derived from our collections
ISSN 0067-1975 (print), 2201-4349 (online)

The Genus *Pseudopomyza* (Diptera: Nerioidea) in Tasmania, with Description of a New Species

David K. McAlpine

Australian Museum Research Institute,
Australian Museum, 1 William Street, Sydney NSW 2010, Australia

Abstract. The family Pseudopomyzidae (Diptera: Schizophora) is recorded from Tasmania for the first time on the basis of two species, *Pseudopomyza (Apops) arenae* sp. nov. and *P. (Dete) collessi* McAlpine. Some details of the morphology of the head and antenna are recorded by means of scanning electron microscopy.

Introduction

The Pseudopomyzidae are infrequently collected flies, although they show a remarkably extensive distribution throughout world latitudes. This extends from northern Eurasia, through the tropics, to southern Chile and Campbell Island of New Zealand (two species recorded for the last; see Harrison, 1976, given as *Protoborborus* Malloch spp.). The family seems to be absent from the Afrotropical Region. Although one species has a wide distribution in Eastern Australia (McAlpine, 1994), these are the first Tasmanian records for the family.

I have attempted (McAlpine, 1994; 1996) to classify the world pseudopomyzids into a reasonable number of genera and subgenera. Hennig (1969) appears to have separated *Protoborborus* generically from *Pseudopomyza* Strobl on the basis of the geographic distance between the ranges of the New Zealand and the Palaearctic species, as he gave no morphological differences in his identification key. This separation was not followed by Mathis (1989).

My views on the relationships of the Pseudopomyzidae and the relevant morphological evidence were given previously (McAlpine, 1996). I do not agree with some views on the subject expressed by McAlpine and Shatalkin (1999), which were inserted in the chapter without my knowledge, though appearing under my name.

Terminology for antennal parts used here follows that of McAlpine (2011).

Material used for this study belongs to the Australian Museum, Sydney (AM); the Australian National Insect Collection, Canberra (ANIC); and the Canadian National Insect Collection, Ottawa (CNC).

Genus *Pseudopomyza* Strobl

Pseudopomyza Strobl 1883: 284. Type species (monotypy): *P. nitidissima* Strobl (= *Opomyza atrimana* Meigen).

I have seen three Australian species of this genus belonging in the subgenera *Apops* McAlpine and *Dete* McAlpine as distinguished by McAlpine (1994). Of these, one species is known only from a single female specimen from Western Australia which is here considered as inadequate material for taxonomic description. It is provisionally identified as *Pseudopomyza (Apops)* sp. C, deposited at ANIC.

The three known Australian species have the following characters in common: two pairs of fronto-orbital bristles present; four pairs of dorsocentral bristles present; anterior intra-alar bristle absent.

Keywords: Pseudopomyza; Nerioidea; Tasmania; Diptera; taxonomy
Taxonomic registration: (LSID publication) http://zoobank.org/8EA80C0C-1214-4C24-A60A-BD9D73058FD7
Received: 24 January 2017 **Accepted**: 27 February 2019 **Published**: 12 June 2019 (in print and online simultaneously)
Publisher: The Australian Museum, Sydney, Australia (a statutory authority of, and principally funded by, the NSW State Government)
Citation: McAlpine, David K. 2019. The genus *Pseudopomyza* (Diptera: Nerioidea) in Tasmania, with description of a new species. *Records of the Australian Museum* 71(3): 87–94. https://doi.org/10.3853/j.2201-4349.71.2019.1674

Key to Australian species of *Pseudopomyza*

1 Central cheek bristle absent; mesoscutum largely glossy, without noticeable pruinescence; eastern Australia (northern Queensland to southern Tasmania) ..... *P. (Dete) collessi*

—— Large central cheek bristle present; mesoscutum subshining, extensively pruinescent 2

2 Mesoscutum with one or more well differentiated unpaired median bristles; fore tarsus entirely dark brown to black (Tasmania) ..... *P. (Apops) arenae*

—— Mesoscutum without differentiated median bristles; fore tarsus bicoloured, with apical segments creamy-white (southern Western Australia) ..... *P. (Apops)* sp. C

Pseudopomyza (Dete) collessi McAlpine

Figs 1, 2

Pseudopomyza (Dete) collessi McAlpine, 1994: 185–186, figs 1–5 [holotype AM K.359151, Wentworth Falls, NSW].

Material from Tasmania: 2♂♂, 8 km W of Geeveston, 14.iii.2005, B. J. Day & D. K. McAlpine (AM).

Distribution and habitat. The specimens here listed are the first for the species to be recorded from Tasmania. Otherwise, *P. collessi* is already recorded for tropical Queensland (Mossman district) and mountainous districts of New South Wales and Australian Capital Territory. The habitat is usually in shaded forest near running water. This is in contrast to the only habitat recorded for *P. arenae* below.

Pseudopomyza (Apops) arenae sp. nov.

http://zoobank.org/NomenclaturalActs/0475448A-4BA6-428E-8AC5-70FA8EA241F1

Figs 3–12

Holotype ♂. Tasmania: The Neck, Bruny Island ["Penguin Rookery" on some maps, c. 43°17'S 147°21'E], 16–18. iii.2005, B. J. Day & D. K. McAlpine (AM K.493926). Mounted on card point. **Paratypes**. Tasmania: 1♂, 6♀♀, same data as holotype (AM K.540941–944, K.556230–231; CNC [with register number K.515414]).

Description (♂, ♀). Small, shining black moderately robust fly, with clear wings and dark legs.

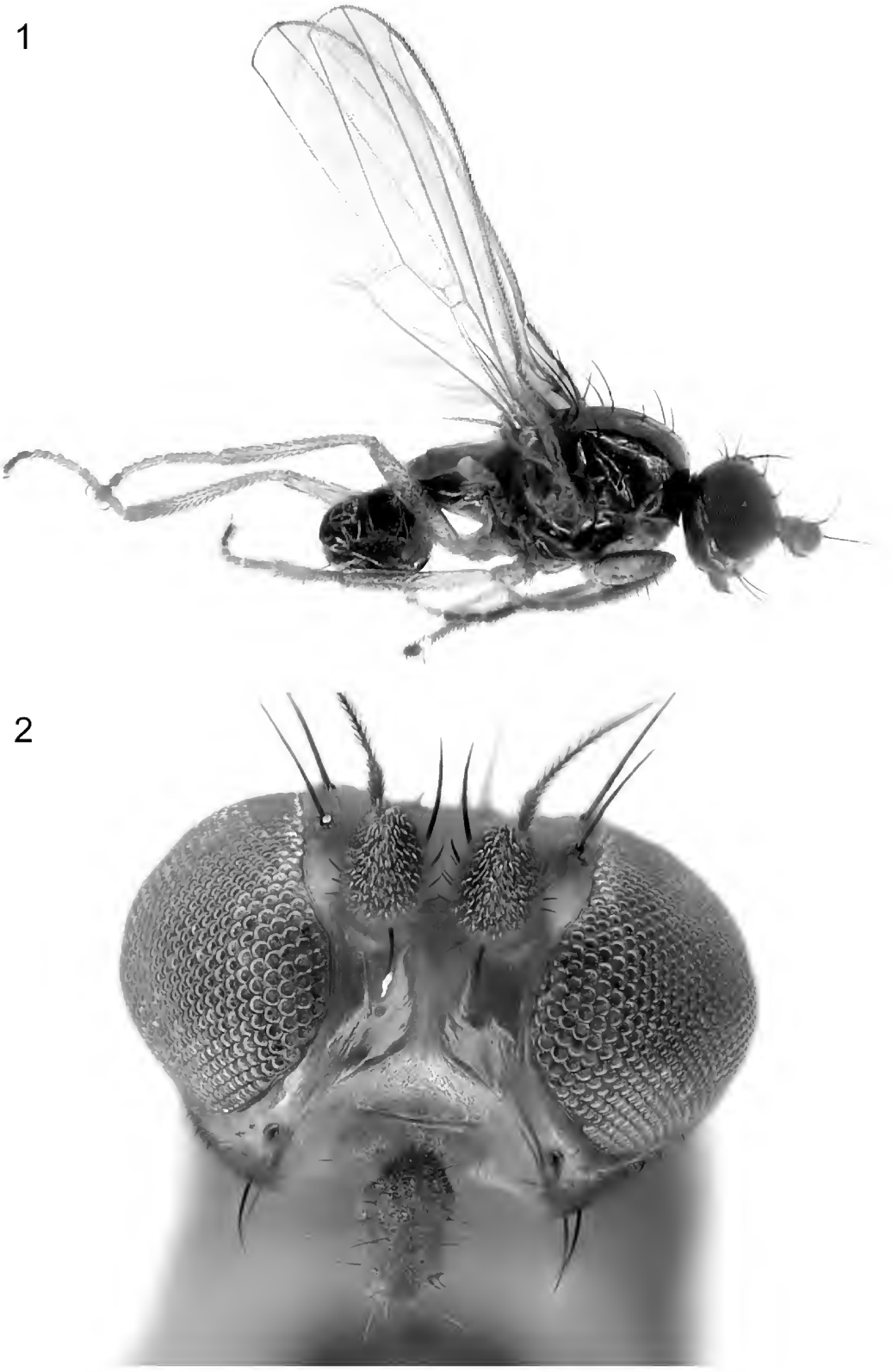
Coloration. Head largely brown-black, with black bristles; cheek region and parafacial tawny-yellow; lateral facial sclerite largely glossy black; central region of face dull tawny. Antennal segments 1 and 2 tawny-brown; segment 3 slightly darker brown; arista black. Prelabrum and palpus dark brown. Thorax predominantly shining black; mesoscutum rather densely finely pruinescent (thus not glossy as in *P. collessi*), scutellum more densely pruinescent dorsally. Wing transparent, without darker shading; setulae on costa black; halter yellow. Coxae dull yellowish; femora largely brown-black; fore femur yellowish at extreme base, other femora more extensively yellowish basally; tibiae dark brown to yellowish; fore tarsus brown, darker in male than in female, particularly basal segment; other tarsi dull tawny. Abdomen subshining black.

Head and eye both higher than long (Fig. 5); postfrons approximately as broad as long, with major bristles large, including ocellar and two fronto-orbitals, with irregularly scattered small setulae but no differentiated interfrontals; anterior margin of postfrons slightly produced medially into a broadly rounded lobe overlapping ptilinum; face broad and almost flat, without setulae, with median submembranous zone widely separating paired lateral sclerites (Fig. 9); cheek c. 0.36–0.38 eye height in profile; vibrissa arising nearer to anterior extremity of cheek in profile than in *P. collessi*; large central cheek bristle present. Antennal segment 2 with circlet of setulae on external surface of rim, including several larger ventromedial components and one largest ventral bristle (in *P. collessi* this circlet of setulae uniformly small except for single very long ventral bristle); arista almost uniformly short-haired, c. 3.7 × as long as segment 3. Prelabrum well sclerotized, shallow and not prominent; palpus small but stout, setulose; labella reduced.

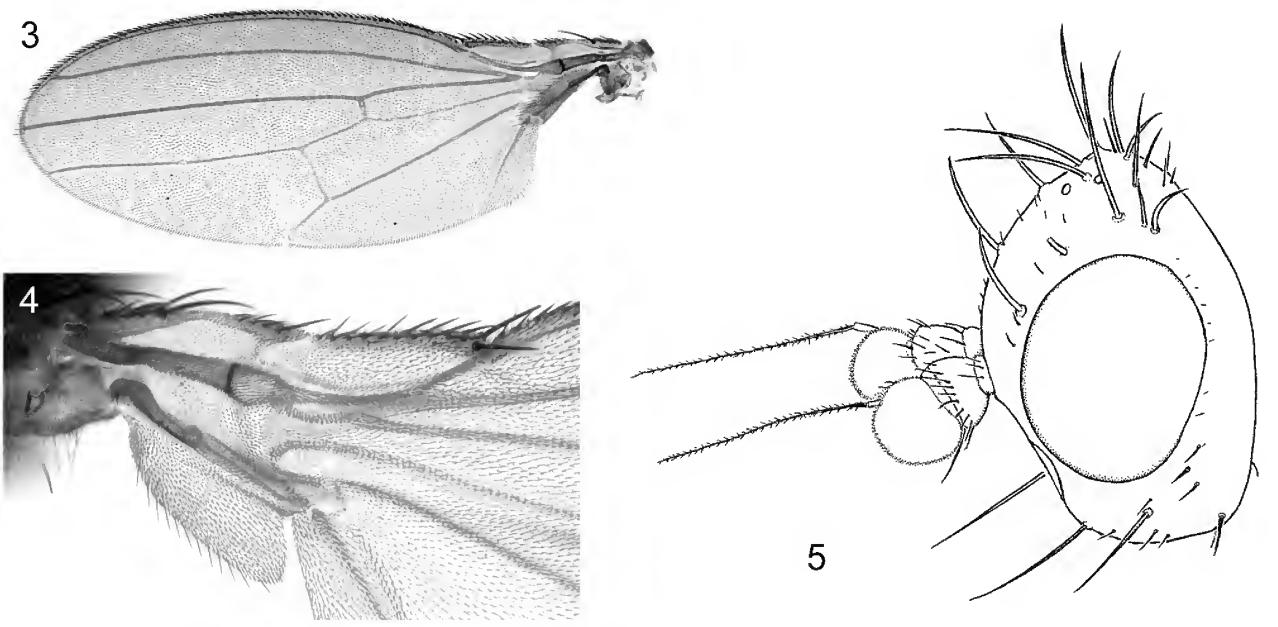
Thorax of moderate proportions; mesoscutum with following bristles well developed: one humeral, 1 + 1 notopleurals, long presutural, 1 + 3 long subequal dorsocentrals, anterior intra-alar bristle absent (in contrast to several foreign species), one short posterior intra-alar bristle (near scutellar suture), two postalar bristles (anterior one shorter); median line of mesoscutum with one or two unpaired bristles; mesopleural and pteropleural bristles absent; one medium-sized sternopleural bristle present; two widely separated pairs of scutellar bristles, posterior ones longer. Wing (Figs 3, 4): costal region with two relatively large but unequal costagial bristles near base, with one or two slightly differentiated bristles basad of humeral break, and pair of relatively prominent bristles at subcostal break; venation otherwise typical of genus.

Male postabdomen (Fig. 7). Tergite 6 large, symmetrical, with few small setulae and, on each side, three large posteroventral bristles; sternite 6 transversely long and slender, strongly arcuate, subsymmetrical, with close series of three posteriorly directed bristles at each lateral extremity; epandrium moderately large, with pair of moderate dorsobasal bristles and few fine setulae; surstylus slender, straight, rod-like, almost bare; cercus moderately prominent, densely setulose.

Dimensions. Total length, ♂ 2.0 mm, ♀ 2.1–2.2 mm; length of thorax, ♂ 0.93 mm, ♀ 0.90–1.1 mm; length of wing, ♂ 2.2 mm, ♀ 2.1–2.4 mm.



Figures 1, 2. *Pseudopomyza collessi*, male, near Geeveston. *(1)* whole insect. *(2)* facial view of head.



Figures 3–5. *Pseudopomyza arenae*. *(3)* left wing of female. *(4)* right wing of female, detail of anterobasal section. *(5)* head of holotype, male.

Distribution and habitat. Only known from the dunes of Bruny Island, southern Tasmania. This is the same locality and habitat as the type locality of *Borboroides gorodkovi* McAlpine (2007, family Heleomyzidae or Heteromyzidae), but the latter species also occurs in several localities on the Australian mainland. These dunes are densely penetrated by burrows of penguins (*Eudyptula minor*) and shearwaters (*Puffinus* sp.) and support only low shrubs and herbage.

Comparative notes. *Pseudopomyza arenae* differs from *P. collessi*, the only other described Australian species of the genus, as indicated in the key to species, also in the facial structure (compare Figs 9 and 2) and, in the male, in the form of the surstylus and the armature of tergite 6. Of the six New Zealand species described by Malloch (1933) and Harrison (1959; 1976), all except *Pseudopomyza flavitarsis* (Harrison) differ from *P. arenae* in having three instead of two pairs of fronto-orbital bristles. *Pseudopomyza flavitarsis* differs from *P. arenae* in its largely pale fore tarsus and, in the male, in the presence of a tuft of large bristles on each distolateral extremity of the epandrium.

The specific epithet is a Latin noun in the genitive case–of a sand patch, in reference to the fly's habitat.

Further morphological studies

Some observations made with the scanning electron microscope of the head and antenna of a female of *Pseudopomyza arenae* may be more significant in terms of general application to knowledge of the family Pseudopomyzidae than for taxonomic characters within this genus, as more detailed species level comparison has not been possible with present resources.

The range of facial structure found in the Pseudopomyzidae includes the basic structure of the superfamily Nerioidea (e.g., in the neriid genus *Telostylinus* Enderlein), often with some modifications. The face of *Pseudopomyza arenae* (Fig. 9) is remarkably broad (slightly more so in female than in male), and only slightly raised dorsomedially between the antennal sockets. Each sclerotized lateral facial plate is broad on the margin of the antennal socket and much narrowed ventrolaterally where it borders on the buccal membrane. The differentiated medial facial zone is therefore very broad towards its lower margin where it borders on the prelabrum. The lower part of the median zone is membranous with numerous minute scale-like microtrichia, while its upper part between the antennal sockets is minutely roughened, without distinguishable microtrichia and probably only slightly flexible.

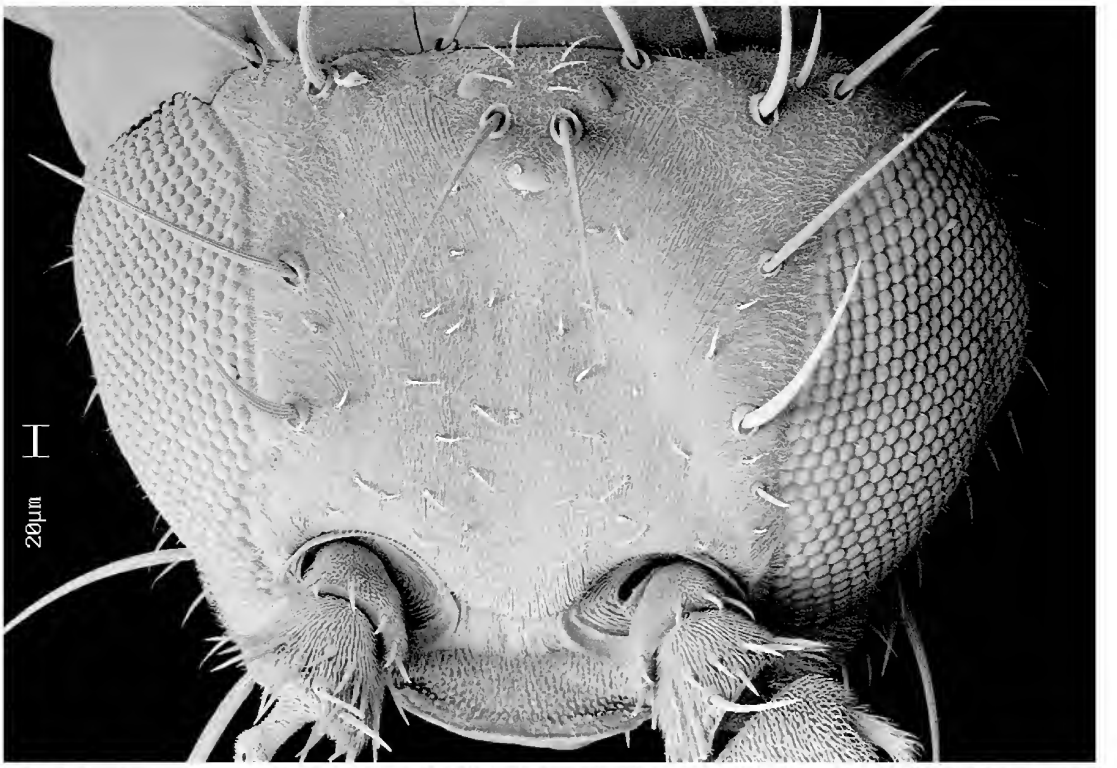
The facial proportions and contour in *P. arenae* lie near an extreme for those seen among species of *Pseudopomyza* s.l., a group which Hennig (1969) divided into several genera based partly on facial structure. The Neotropical species that he placed in the genus *Rhinopomyzella* Hennig (later reduced to a subgenus) have the lateral facial plates more extensively broadened, particularly towards the lower extremity. The differentiated median zone is much narrower and elevated so that the face has a raised median keel. In one apparently undescribed species (La Cumbre, Dominican Republic, damaged specimens in CNC) the face has a narrowly raised nose-like median prominence and the median zone appears, without special preparation,

Figures 6, 7. *Pseudopomyza arenae*. *(6)* holotype male. *(7)* male postabdomen, left lateral view; scale = 200 μm.

to be little differentiated. However, related Neotropical species (subgenus *Rhinopomyzella*) show a facial structure intermediate between the above condition and that of the Australian *Pseudopomyza (Dete) collessi* (Fig. 2).

The antenna of *Pseudopomyza arenae*, as in other pseudopomyzids, is essentially porrect (Fig. 5). Segment 2 approximates to radial symmetry, with an elongate, centrally situated conus, which bears distally the oblique foraminal ring surrounding the foramen of articulation with segment 3. The pedicellar button is located preapically on the conus (Fig. 12). The subspherical segment 3 (Fig. 10) has a deep basal hollow to receive the long conus and also has a basolateral pore opening to the sacculus. The arista is three-segmented and attached subdorsally near mid-length of segment 3.

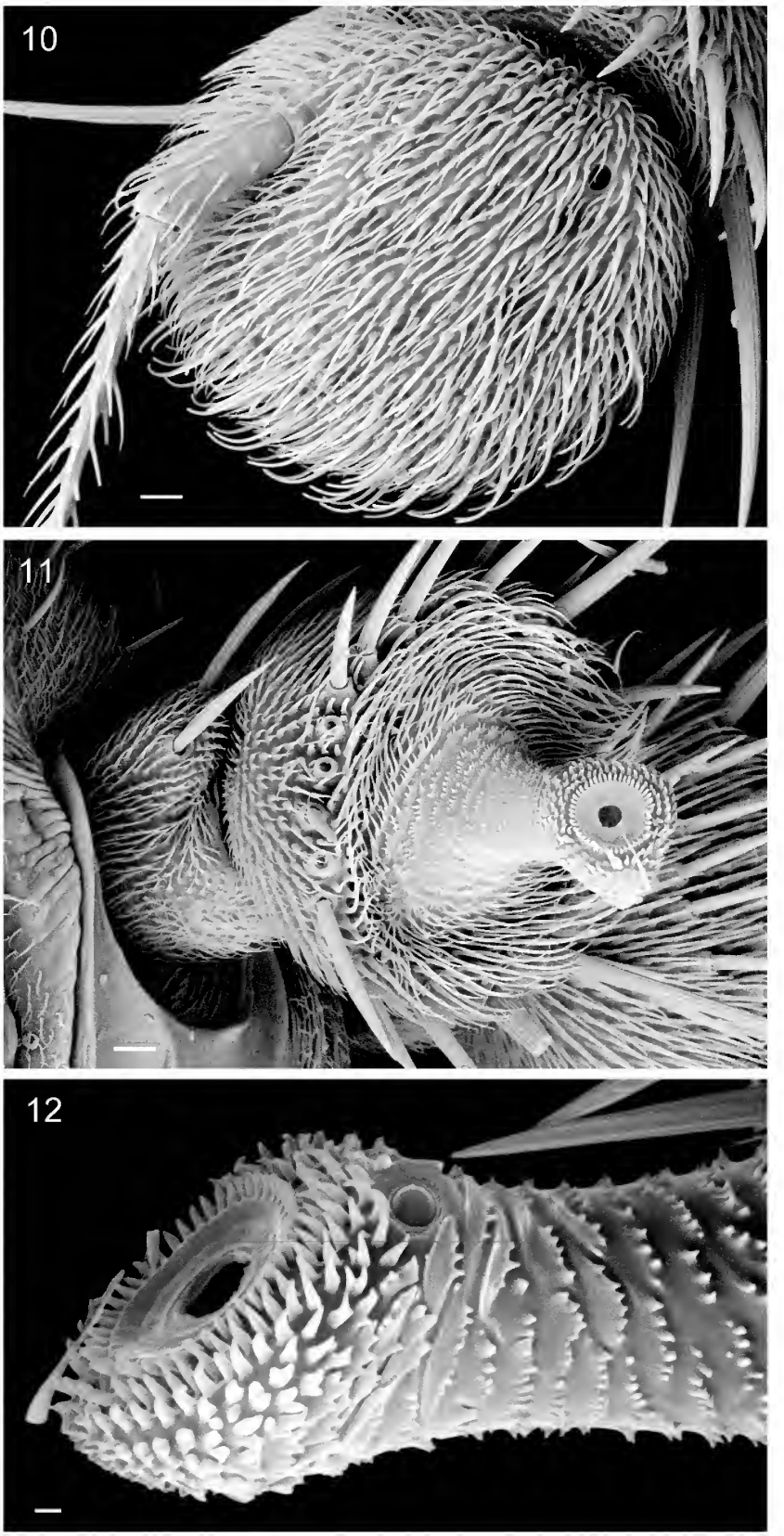
This study shows strong resemblance in the form and placement of the conus between *Pseudopomyza* and the genus *Milichiella* Giglio-Tos of the family Milichiidae (see McAlpine 2011, figs 61, 62). *Pseudopomyza* was formerly placed in that family (e.g., Frey, 1952). However, in *Milichiella* the spinules on the stem-section of the conus are separate and simple, whereas in *P. arenae* they are mostly grouped together on short transverse ridges (Fig. 12).



8

9

Figures 8, 9. *Pseudopomyza arenae*, head of female *(8)* frontal view. *(9)* facial region.



Figures 10–12. *Pseudopomyza arenae*, antennae of female. *(10)* left antennal segment 3 and arista. *(11)* right antenna after disarticulation of segment 3, showing conus on exposed distal surface of segment 2. *(12)* distal part of right conus, dorsal view, showing pedicellar button. Scale bars: Figs 10 and 11, 10 μm; Fig. 12 = 2 μm.

Acknowledgments. I am indebted to Suzanne Lindsay for work with the scanning electron microscope and to John C. Martin for microphotography. The following arranged the loan of specimens: Richard Vockeroth and Jeffrey Cumming (CNC), Donald Colless and David Yeates (ANIC). Helen M. Smith gave critical help with the preparation of the manuscript. Barry Day assisted with field work in Tasmania.

References

Frey, R. 1952. Über *Chiropteromyza* n.gen. und *Pseudopomyza* Strobl (Diptera Haplostomata). *Notulae entomologicae* 32: 5–8.

Harrison, R. A. 1959. Acalypterate Diptera of New Zealand. *New Zealand Department of Scientific and Industrial Research, Bulletin* 128: 382 + vii pp.

Harrison, R. A. 1976. The Arthropoda of the Southern Islands of New Zealand (9) Diptera. *Journal of the Royal Society of New Zealand* 6: 107–152.
https://doi.org/10.1080/03036758.1976.10421469

Hennig, W. 1969. Neue Gattungen und Arten der Acalypteratae. *The Canadian Entomologist* 101: 589–633.
https://doi.org/10.4039/Ent101589-6

Malloch, J. R. 1933. An aberrant New Zealand borborid (Diptera, Borboridae). *Stylops* 2: 260–262.
https://doi.org/10.1111/j.1365-3113.1993.tb00963.x

Mathis, W. N., 1989. Family Pseudopomyzidae. In *Catalog of the Diptera of the Australasian and Oceanian Regions,* ed. N. L. Evenhuis, p. 470. Leiden: E. J. Brill and Honolulu: Bishop Museum Press.

McAlpine, D. K. 1994. A new Australian species of pseudopomyzid fly (Diptera: Nerioidea) and the subgenera of *Pseudopomyza*. *Proceedings of the Linnean Society of New South Wales* 114: 181–188.

McAlpine, D. K. 1996. Relationships and classification of the Pseudopomyzidae (Diptera: Nerioidea). *Proceedings of the Linnean Society of New South Wales* 116: 223–232.

McAlpine, D. K. 2007. Review of the Borboroidini or wombat flies (Diptera: Heteromyzidae), with reconsideration of the status of families Heleomyzidae and Sphaeroceridae, and descriptions of femoral gland-baskets. *Records of the Australian Museum* 59(3): 143–219.
https://doi.org/10.3853/j.0067-1975.59.2007.1487

McAlpine, D. K. 2011. Observations on antennal morphology in Diptera, with particular reference to the articular surfaces between segments 2 and 3 in the Cyclorrhapha. *Records of the Australian Museum* 63(2): 113–166.
https://doi.org/10.3853/j.0067-1975.63.2011.1585

McAlpine, D. K., and A. I. Shatalkin. 1999. 3.8. Family Pseudopomyzidae. In *Contributions to a Manual of Palaearctic Diptera,* ed. L. Papp and B. Darvas, vol. 3, pp. 155–163. Budapest: Science Herald.

Strobl, G. 1883. Neue österreichische Muscidae Acalypterae, III Theil. *Wiener entomologische Zeitung* 12: 280–285.

Records of the Australian Museum (2019)
vol. 71, issue no. 3, pp. 95–104
https://doi.org/10.3853/j.2201-4349.71.2019.1675

Records of the Australian Museum
a peer-reviewed open-access journal
published by the Australian Museum, Sydney
communicating knowledge derived from our collections
ISSN 0067-1975 (print), 2201-4349 (online)

Review of the Australian Signal Flies of the Genus *Microepicausta* (Diptera: Platystomatidae)

David K. McAlpine

Australian Museum Research Institute,
Australian Museum, 1 William Street, Sydney NSW 2010, Australia

Abstract. Three Australian species of the platystomatid genus *Microepicausta* Hendel, 1914, are identified and keyed. Available information on their distribution and habitat is recorded. *Elassogaster terrae-reginae* Malloch, 1928, is a new junior synonym of *Microepicausta gracilis* Hendel, 1914. The following Australian species are described: *Microepicausta fenestra* sp. nov., *Microepicausta wirthi* sp. nov.

Introduction

In listing material, the following collectors' names are abbreviated to the initials: R. A. Barrett, A. Daniels, G. Daniels, R. Eastwood. G. F. Hill, Z. Liepa, D. K. McAlpine, R. Meier, K. R. Norris, J. Walsh, T. A. Weir.

The following abbreviations refer to institutions holding collections:

AM	Australian Museum, Sydney
ANIC	Australian National Insect Collection, CSIRO, Canberra
MNM	Hungarian Natural History Museum, Budapest
QM	Queensland Museum, Brisbane
SPHTM	School of Public Health and Tropical Medicine (platystomatid collection now transferred to AM)
USNM	National Museum of Natural History, Washington

Morphological terminology here used follows that of McAlpine (1973).

Systematics

Genus *Microepicausta* Hendel

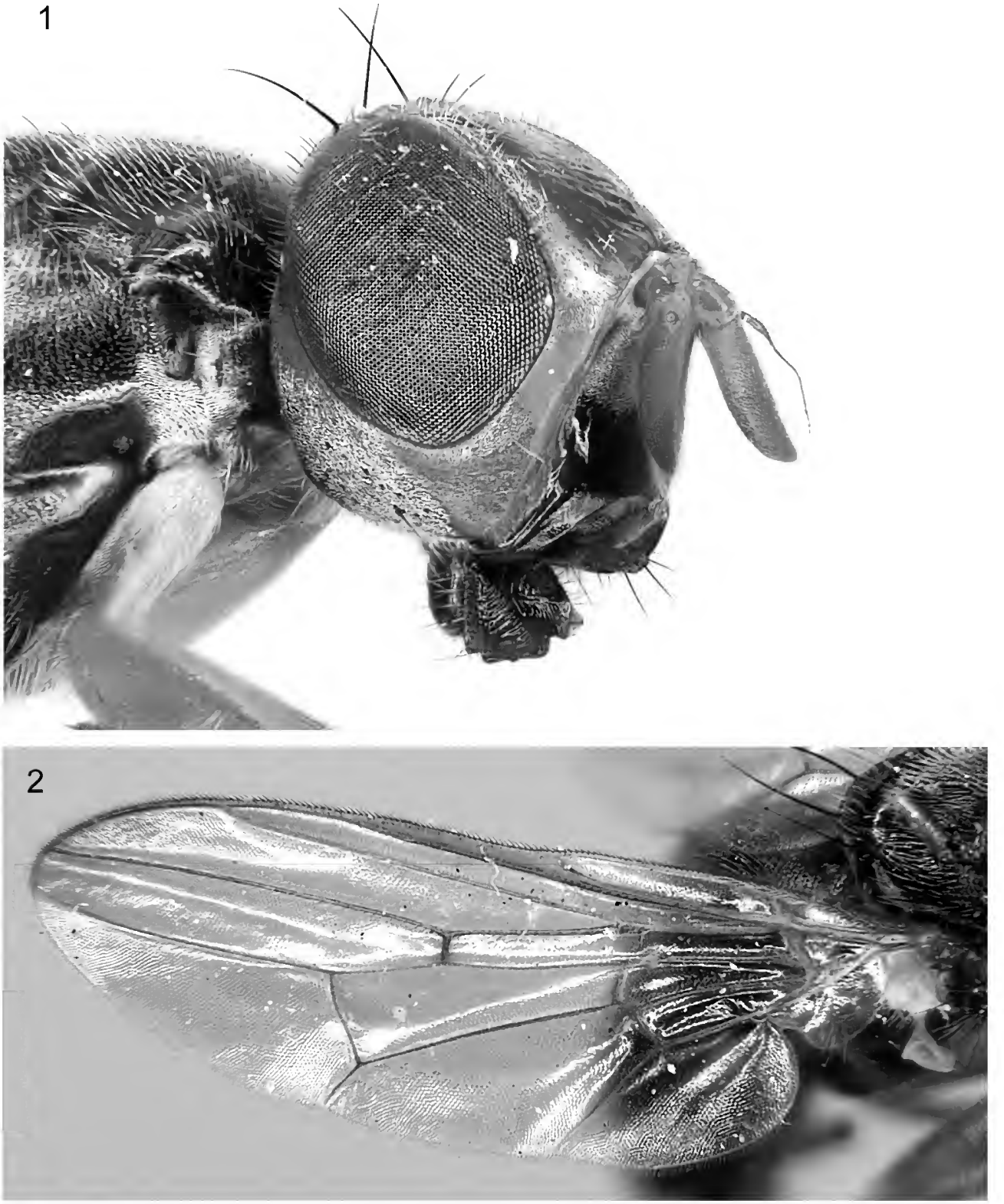
Microepicausta Hendel, 1914a: 52–54. Type species (original designation) *M. gracilis* Hendel.

Description and delimitation. See Hendel (1914a) and further notes by McAlpine (2001: 152). The genus should be identifiable from the key to platystomatid genera in McAlpine (2001: 121–130). The species superficially resemble those of *Plagiostenopterina* Hendel and *Elassogaster* Bigot, but the males have a single hollow terminal filament on the aedeagus, while apparently all related genera have two (rarely three) terminal filaments, each with apical gonopore.

Evenhuis (1989:493) listed six Australasian species of *Microepicausta*. His two included Australian species, *M. gracilis* Hendel and *M. terraereginae* (Malloch) are now considered to be synonyms, and *M. evitta* (Malloch) from the Bismarck Archipelago is now placed in the genus *Par* McAlpine, 2001. The known Australian species, treated below, live on the northern and eastern Australian coasts as far south as Tasmania, with one record for coastal South Australia. Other species that I have seen range from West New Guinea to New Ireland and the Solomon Archipelago.

Keywords: *Microepicausta*; Platystomatidae; Diptera; taxonomy
Taxonomic registration: (LSID publication) http://zoobank.org/7FA73A85-55D2-429B-AD7D-817D50B49768
Received: 22 May 2017 **Accepted**: 27 February 2019 **Published**: 12 June 2019 (in print and online simultaneously)
Publisher: The Australian Museum, Sydney, Australia (a statutory authority of, and principally funded by, the NSW State Government)
Citation: McAlpine, David K. 2019. Review of the Australian signal flies of the genus *Microepicausta* (Diptera: Platystomatidae). *Records of the Australian Museum* 71(3): 95–104. https://doi.org/10.3853/j.2201-4349.71.2019.1675

Habitat. In temperate eastern Australia, the two represented species, *Microepicausta gracilis* Hendel and *M. wirthi* sp. nov. are restricted to areas near the coast with a sandy substrate. *Microepicausta wirthi* is particularly restricted to the immediate vicinity of the shoreline on dunes and the landward borders of beaches. The flies have commonly been found on the native grass *Spinifex sericeus*, which is one of the most conspicuous plants in this habitat. Though the larvae of *Microepicausta* spp. are not yet known, I suspect that those of *M. wirthi* may be associated with the rhizomes or root systems of this plant.



Figures 1, 2. *Microepicausta gracilis* Hendel, male, Bronte, NSW. *(1)* Head and part of thorax. *(2)* Right wing.

Key to Australian species of *Microepicausta*

1 Prelabrum small and receding; mesoscutum extensively whitish-pruinescent, with limited black markings or none (Figs 8, 9); major bristles of head and thorax pale yellowish ..... *M. wirthi* sp. nov.

— Prelabrum well developed; mesoscutum largely black with median grey-pruinescent stripe; major bristles of head and thorax black 2

2 Second basal cell and basal half of first basal cell largely bare; mesopleuron with small zone behind anterior spiracle smooth, without setulae; male: aedeagus with functional terminal filament not over 3× as long as glans and with secondary terminal process (Fig. 7, *tp*); female: aculeus of postabdomen narrowly rounded apically; northern Australia ..... *M. fenestra* sp. nov.

— First and second basal cells almost entirely microtrichose; mesopleuron anterodorsally with extensive zone of numerous fine setulae reaching approximately to anterior spiracle; male: aedeagus with terminal filament more than 6× as long as glans, without secondary process (Fig. 3); female: aculeus tapering to narrow, sharp apex; eastern Australia ..... *M. gracilis* Hendel

Microepicausta gracilis Hendel

Figs 1–3

Microepicausta gracilis Hendel, 1914a: 54, pl. 5, figs 101, 102 (no specific description); 1914b: 85–86 (description).
Elassogaster terrae-reginae Malloch, 1928: 352–353; Malloch, 1931: 22, **syn. nov.**

Type material. I made the following notes on type material of *M. gracilis* in MNM, Budapest, in April 1973: holotype ♀, i.e. specimen of which both head and wing were figured [Hendel, 1914a, pl. 5, figs 101, 102], Australia, L. Biró 1900, Sydney Botany B. Second specimen ♀, same data, is not a type, though labelled as such. Third specimen of series, also labelled "type" is a small ♀ of *Rhytidortalis rugifrons*. I have labelled it so, but the species is now provisionally given as *Duomyia rugifrons* (Thomson) according to McAlpine (2000).

Types of *E. terrae-reginae*: holotype ♂, Queensland: Townsville, 1.iv.1922 (in cop), G.F.H. (AM K.90460, formerly in SPHTM); allotype ♀, same data, "fragmentary", only wings remaining (AM K.90461).

Other material (localities only given). New South Wales: Iluka (AM); Angourie (AM); Red Rock, near Woolgoolga (AM); Tucker's Rock, near Repton (AM); Bundagen, near Repton (AM); Harrington (AM); Manning Point, near Taree (AM); Black Head, near Halliday's Point (AM); Shoal Bay, near Port Stephens (AM); Toukley (ANIC); Woy Woy (ANIC); Narrabeen (AM); Dee Why, near Sydney (Fig. 13, AM); Bronte, near Sydney (AM); Cook's River, near Sydney (AM); Kurnell (AM); North Cronulla (AM); Grey's Point, near Cronulla (AM); Durras (ANIC); Ulladulla (ANIC); Bendalong (AM); Broulee (ANIC); Narooma (AM, ANIC); Wallagoot Lake (ANIC); Merimbula (AM); Nadgee, near Eden (AM). Queensland: Cliff Island, Princess Charlotte Bay (ANIC); Palm Islands, near Ingham (QM); Deepwater National Park, S of Agnes Water (AM); Mooloolaba, near Maroochydore (ANIC); Caloundra (QM); Bribie Island (QM); Nerang river, near Surfers Paradise (ANIC).

Description (♂, ♀). Resembling *M. fenestra* in most characters, except as indicated below.

Coloration mostly as for *M. fenestra*. Postfrons often partly tawny-brown. Palpus dark brown to black. Mesoscutum with median whitish pruinescent stripe, but no pale pruinescent lateral zone; mesopleuron with separate anterior and posterior whitish-pruinescent zones, latter zone extending on to sternopleuron. Fore coxa yellow; other coxae largely brownish; femora usually brown, often becoming yellowish towards bases; fore tarsus black; other tarsi brown to yellowish. Wing markings and halter approximately as in *M. fenestra*. Abdomen black.

Head with postfrons generally slightly longer than face. Antenna approximately as in *M. fenestra*; segment 3 tapered apically.

Thorax. Humeral callus with only moderately developed hairs. Legs with armature resembling that of *M. fenestra*. Wing venation very like that of *M. fenestra* but showing considerable variation in details of proportion and contour; much or all of second costal cell, first and second basal cells, anal cell and alula almost uniformly microtrichose.

Male postabdomen: stipe very long, with small, compact glans, without secondary elongate process, but bearing single very long, distally tapered, simple terminal filament with terminal gonopore.

Female postabdomen: aculeus tapering to finely acuminate apex.

Dimensions. Total length, ♂ 3.1–5.7 mm, ♀ 4.1–5.7 mm; length of thorax, ♂ 1.1–2.3 mm, ♀ 1.4–2.1 mm; length of wing, ♂ 2.7–4.9 mm, ♀ 3.5–4.7 mm.

Distribution. Queensland: coastal districts from Princess Charlotte Bay southwards. New South Wales: coastal districts generally.

Notes. It was initially difficult to evaluate variation in the collections belonging to this species or apparent complex, because of variation in pigmentation of the legs (particularly of the femora) and the apparent form of the elongate hypandrial tube. Study of numerous specimens of both sexes shows that the variation in leg coloration is unlikely to have taxonomic significance. Careful preparation of the male postabdomen seems to indicate that the apparent differences are not due to structure, but to the position in which the hypandrial tube became lodged when the insect died.

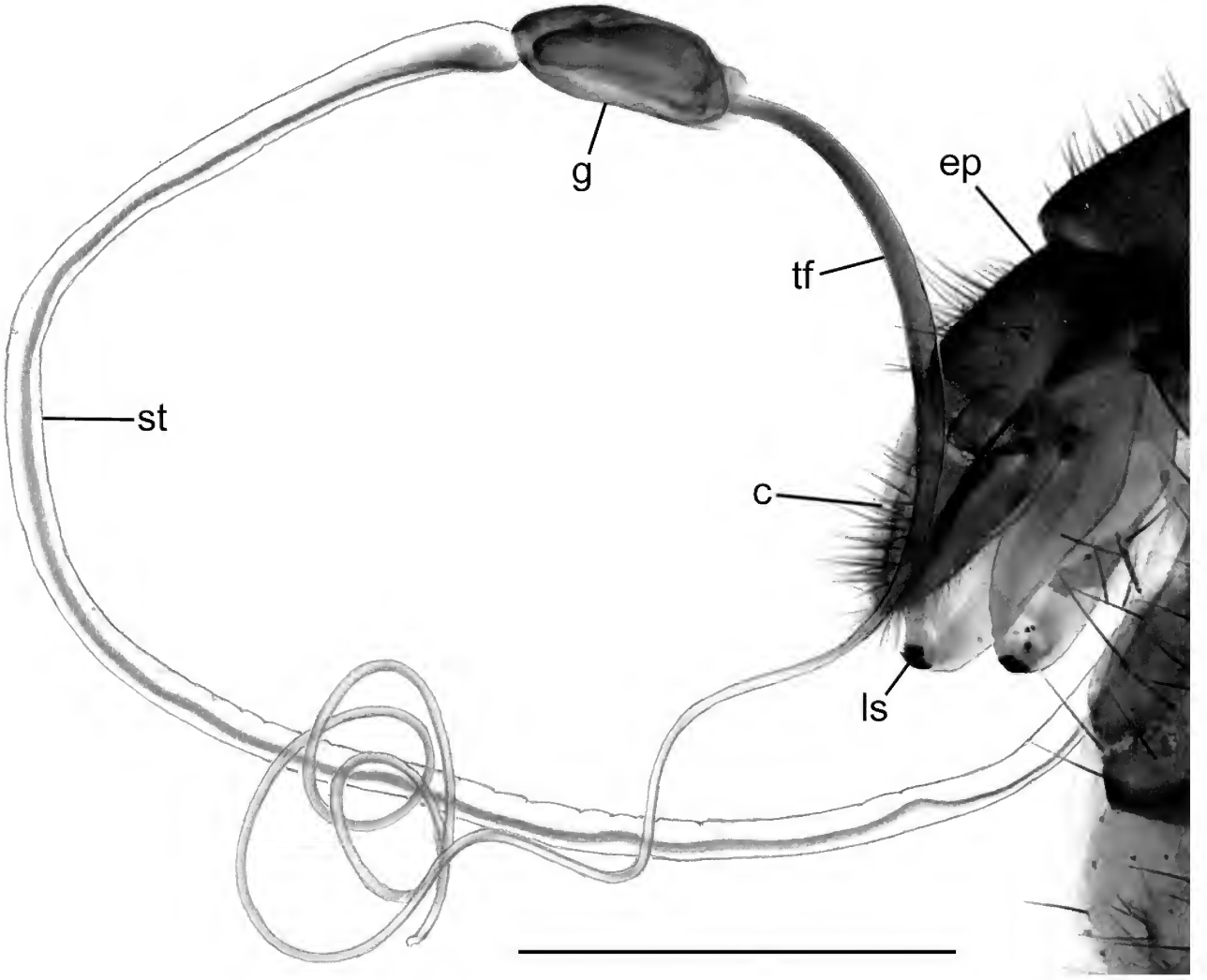


Figure 3. *Microepicausta gracilis* Hendel, Bronte, NSW. Details of male postabdomen, from retouched photograph. Scale = 0.5 mm. *c*, cercus; *e*, epandrium; *g*, glans; *is*, inner surstylus; *st*, stipe; *tf*, terminal filament.

Microepicausta fenestra sp. nov.

http://zoobank.org/NomenclaturalActs/2AB7C9FE-2818-4717-94BD-29DF293A384F

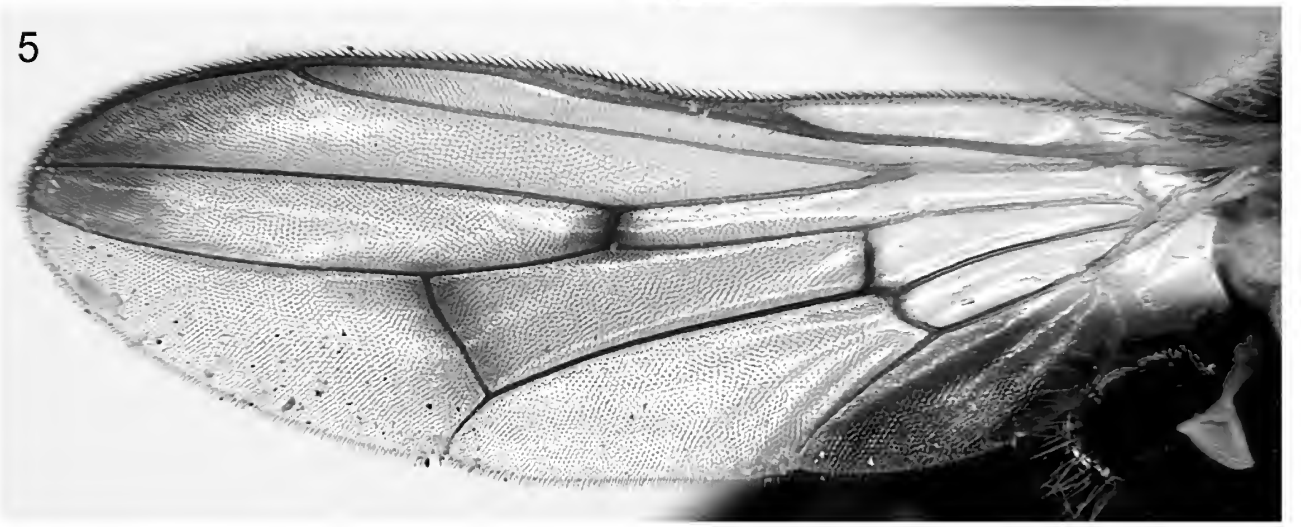
Figs 4–7

Holotype ♂. Queensland: 13 km W of Musgrave [14°48'S 143°23'E, 220 m], 14.i.1994, G.D., A.D., R.E., mercury vapour lamp (AM K.504392). Double-mounted on micro-pin through polyporus. **Paratypes**. Queensland: same data as holotype 1♂, 2♀♀ (AM).

Other material. Northern Territory: Rimbija I., Wessel Islands, [11°01'S 136°45'E], Feb. 1977, T.A.W., R.A.B., 1♂ (AM), 3♂♂, 1♀ (ANIC).

Description (♂, ♀). Somewhat elongate black, largely shining fly.

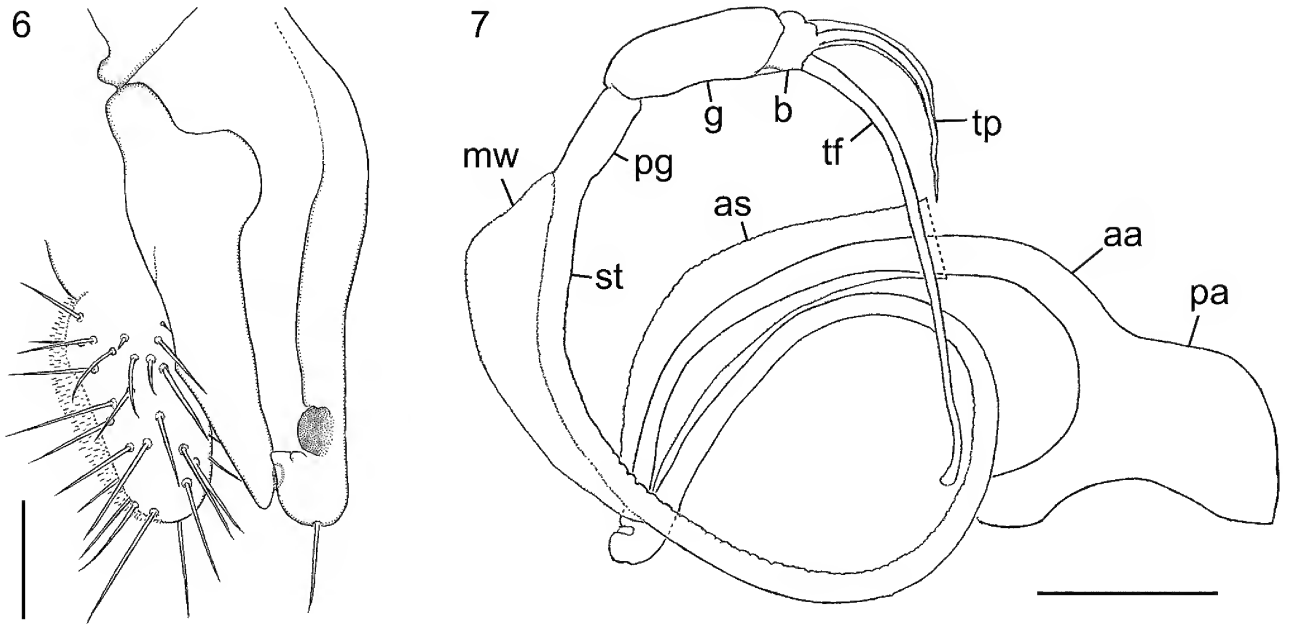
Coloration. Head with largely black to brown-black ground-colour, with major bristles black, most minor setulae or hairs whitish; postfrons with silvery-grey pruinescent orbital margins; parafacial broadly silvery-grey pruinescent on tawny-brown cuticle, pruinescent zone extending over cheek region and on to lower postocular zone, but not on to extensively shining black occipital region; face shining black, its approximate upper half with zone of fine silvery-grey pruinescence narrowly or indistinctly divided on median line, occiput with small whitish-pruinescent zone above cervical foramen. Antenna tawny-brown; segment 3 becoming darker distally; arista brown to blackish. Prelabrum shining black; palpus brown, often with narrowly yellowish apex. Thorax largely shining to subshining black with blue to green reflections, with major bristles black and most fine hairs or setulae white; mesoscutum with median whitish-pruinescent stripe on whole length and lateral pruinescent zone on notopleural region; mesopleuron with extensive posterodorsal whitish-pruinescent zone; propleuron and substantial zone below mid coxa on sternopleuron whitish-pruinescent; posterior parts of pleura with pruinescence of varying density; scutellum black, almost without pruinescence. Coxae brown with grey pruinescence, palest on fore coxa; femora and tibiae brown-black; fore tarsus dark brown; other tarsi dull yellow with brown apices. Wing with nebulous brown anterodistal zone covering region from distinctly beyond end of vein 1 to apex of vein 4; anterior crossvein and discal crossvein each surrounded by compact brown suffusion; veins brown. Halter pale brown basally, with pale yellow capitellum. Abdominal tergites and sternites shining black.



Figures 4, 5. *Microepicausta fenestra* sp. nov., holotype male. *(4)* head and part of thorax. *(5)* right wing.

Head in profile higher than long, with postfrons much longer than face; face rather short and broad, with only slightly raised median elevation, thus concave in profile; height of cheek c. 0.15–0.22 of height of eye. Antennal segment 3 tapered to subacute apex; arista almost bare, except for trace of minute pubescence near base. Prelabrum moderately large and deep, slightly receding below; palpus moderately large, setulose, broadly rounded apically.

Thorax elongate; humeral callus and mesoscutum very extensively haired; in female only, humeral callus with tuft of slightly longer black setulae behind humeral bristle, these undifferentiated in male; scutellum shorter than semicircle in dorsal view, with hairs rather long and generally distributed, but not dense; mesopleuron with numerous long hairs, mainly on posterior part; sternopleuron extensively haired. Fore femur with a series of long, fine posteroventral bristles,



Figures 6, 7. *Microepicausta fenestra* sp. nov., Musgrave, Qld. Details of male postabdomen. *(6)* Right cercus and surstyli. Scale = 0.1 mm. *(7)* Aedeagus and associated structures. Scale = 0.3 mm. *aa*, aedeagal apodeme; *as*, aedeagal sheath; *b*, bulb of aedeagus; *g*, glans; *mw*, membranous wing of stipe; *pa*, process of aedeagal apodeme (paired); *pg*, preglans; *st*, stipe; *tf*, terminal filament; *tp*, terminal process of bulb.

without differentiated dorsal bristles; other femora without distinct bristles; mid tibia with single large terminal ventral spur and several much smaller ones; legs otherwise without well developed armature. Wing as in Fig. 5; first costal cell, much of second costal cell, basal part of first basal cell, almost entire second basal and anal cells bare; alula bare; most of rest of wing membrane almost uniformly microtrichose.

Abdomen. Preabdomen and female postabdomen with the general characters of the genus. *Male postabdomen*: anterior and posterior surstyli and cercus of similar length and prominence; outer (anterior) surstylus with single long terminal setula, its concave posterolateral surface with fine, dense, plush-like pubescence; inner surstylus without apparent surface armature, with attenuated basal articulation; cercus with numerous long setulae, on posterior surface with long, dense, erect pubescence; membranous aedeagal sheath (containing aedeagal apodeme) elongate, but not prominently projecting (at least in type material); stipe of aedeagus distally with transparent membranous wing, which does not extend on to the otherwise slightly differentiated preglans; terminal bulb of glans compact and sclerotized, bearing an elongate, tapering process; terminal filament c. 2.4× as long as glans, simple, not much tapering distally.

Female postabdomen: aculeus broader than in *M. gracilis* and *M. wirthi*, not tapering distally, rounded at apex.

Dimensions. Total length, ♂ 5.0–6.5 mm, ♀ 5.0–5.6 mm; length of thorax, ♂ 2.1–2.2 mm, ♀ 2.0–2.1 mm; length of wing, ♂ 4.4–4.5 mm, ♀ 4.1–4.2 mm; length of glans of aedeagus 0.3 mm.

Distribution. Queensland: Cape York Peninsula. Northern Territory: Wessel Islands.

Notes. This species is readily distinguished from the other known Australian species of *Microepicausta* by the characters given in the key to species. The dark brown palpus, the whitish pruinescence on the upper part of the otherwise black prelabrum, and the largely bare anal cell help to differentiate *M. fenestra* from some non-Australian species, several of which are undescribed.

The specific epithet is a Latin noun meaning window, in reference to the clear zones lacking microtrichia in the anal cell and first and second basal cells of the wing.

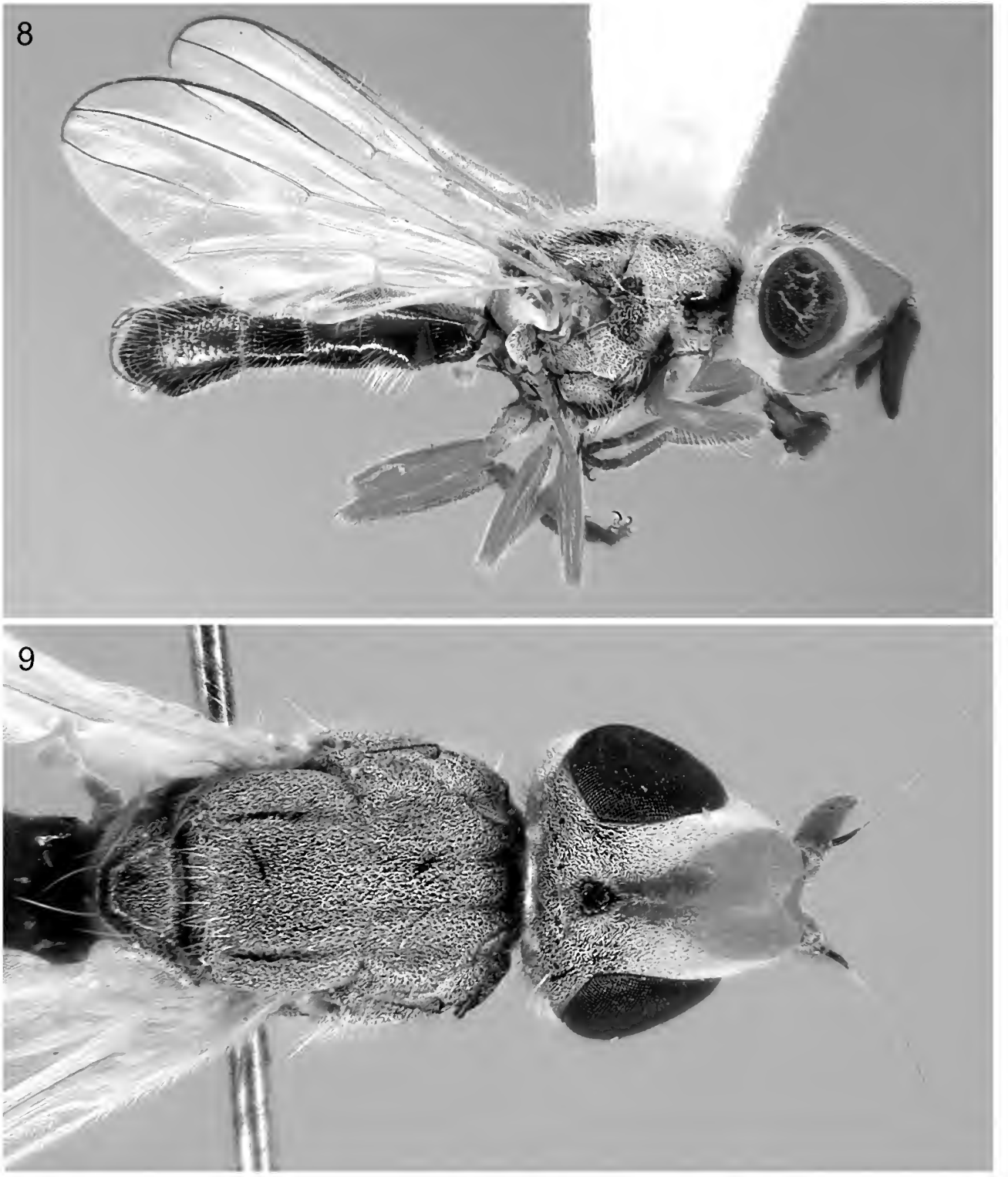
Microepicausta wirthi sp. nov.

http://zoobank.org/NomenclaturalActs/CF393AE4-A085-4984-855E-119CE53976BC

Figs 8–12

Holotype ♂. New South Wales: Nullica Beach, near Eden [37°06'S 149°53'E], 17.xi.1997, R.M., D.K.M., on *Spinifex* [presumably *S. sericeus*] (AM K.504393). Glued to card mount. **Paratypes**. New South Wales: same data as holotype, 20♂♂, 14♀♀ (AM), 4♂♂, 5♀♀ (USNM); Nadgee [37°28'S 149°58'E], Jan. 1967, J.W. 2♂♂, 1♀ (AM); Merimbula, Jan. 1960–1966, K.R.N., 2♂♂, 2♀♀ (ANIC); Narooma, Jan. 1963, Z.L. 1♂, 1♀, (AM), 2♂♂ (ANIC).

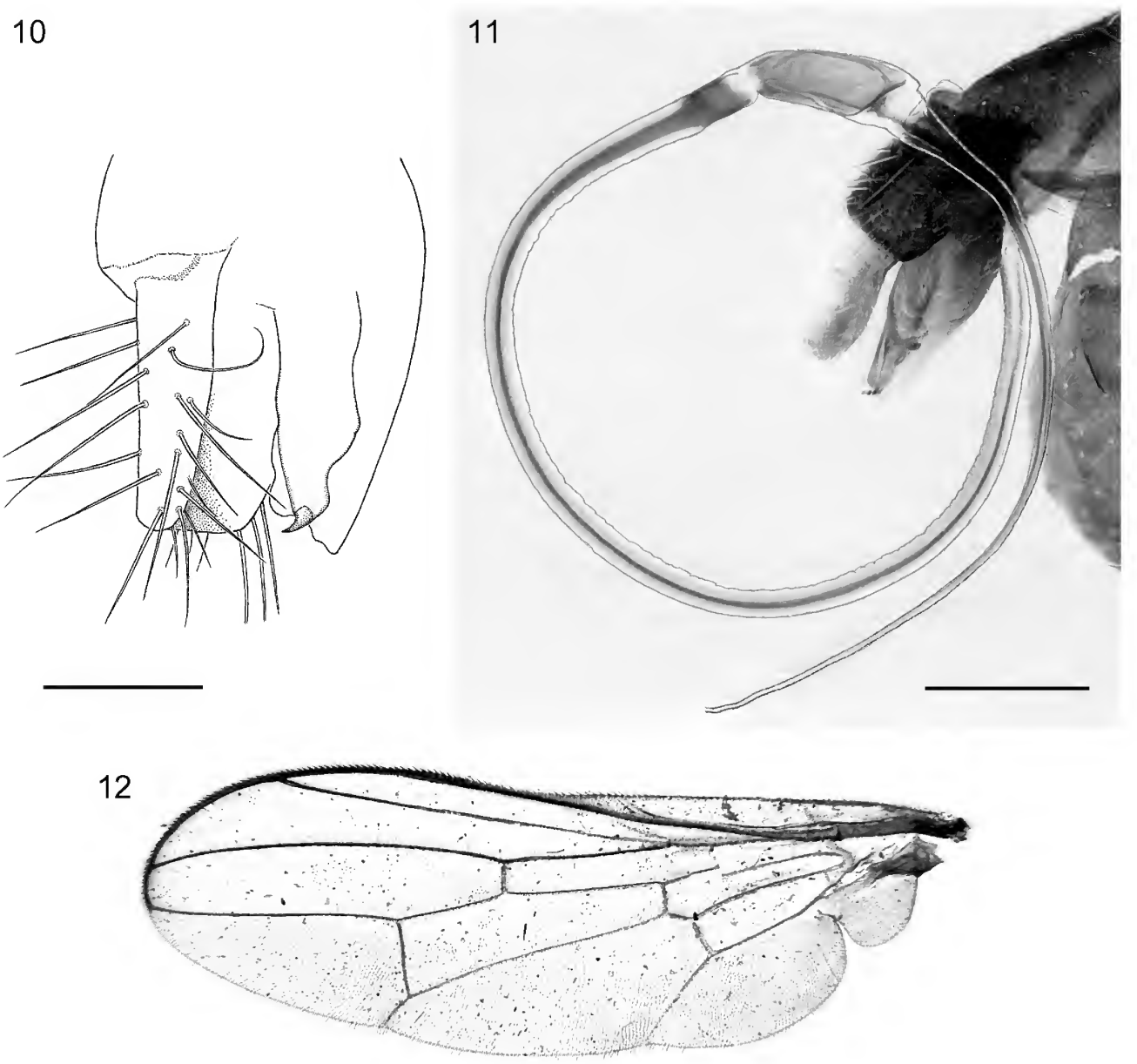
Other material examined (localities only given). New South Wales: Red Rock, near Woolgoolga (AM); North Beach, Bellinger River (AM); Nambucca Heads (ANIC); Camden Head, near Harrington (AM); Toukley (ANIC); Terrigal (ANIC); Turimetta Beach, near Sydney (AM); Dee Why, near Sydney (Fig. 13, AM, USNM); Durras, near Bateman's Bay (ANIC); Broulee (ANIC). Queensland: Queen's Bay, Bowen (ANIC); Yeppoon (ANIC); Broadbeach, Gold Coast (ANIC). Tasmania: Stumpy's Beach, Mount William National Park (AM); Ironhouse Point, near Falmouth (AM). South Australia: vicinity of beach, Victor Harbour (AM).



Figures 8, 9. *Microepicausta wirthi* sp. nov., Nullica Beach, NSW. *(8)* Holotype male. *(9)* Female, head and thorax.

Description (♂, ♀). Elongate rather small fly, of pale colour for genus, due to extensive whitish pruinescence on much of otherwise largely dark thoracic cuticle.

Coloration (geographically variable). Head largely yellow with white bristles and setulae; fronto-orbital plates broadly white-pruinescent; frontal triangle forming brown-black spot surrounding ocelli, often larger and more distinct in males; upper occipital region with extensive dark brown cuticular zone, covered with dense greyish white pruinescence; facial carina often partly brownish. Antennal segment 1 yellow; segment 2 yellowish brown (female) to dark brown (typical males); segment 3 grey-black (typical males) or partly yellowish (typical females); arista brown. Palpus yellow; prelabrum brownish, usually paler in females. Thorax typically with shining black ground colour and extensive covering of dense grey-white



Figures 10–12. *Microepicausta wirthi* sp. nov., Nullica Beach, NSW. Details of male postabdomen. *(10)* Right surstyli and fused cerci. Scale = 0.1 mm. *(11)* Aedeagus (retouched) and associated structures. Scale = 0.2 mm. *(12)* Left wing.

pruinescence, often more extensive in female, dorsally usually with paired black markings, more developed in males than females; sternopleuron typically with broad shining blackish central zone, and pale pruinescent zones on dorsal and ventromedian margins; scutellum with variable extent of pale dorsal pruinescence, often more developed in female. Wing transparent, without darker markings or shading; veins largely yellowish; distal parts of costa and veins 3 and 4 brown; setulae on vein 1 all pale; halter yellow. Legs yellowish, extensively variegated with brown, more so in males, particularly those of southern populations. Abdominal tergites and sternites shining black or brown-black, with whitish setulae; pleural membrane largely yellowish.

Head in profile c. as long as high, with postfrons forming acute angle with face; eye small for genus, less than twice as high as cheek; facial carina narrow but elevated, with rounded summit. Antennae in male large, extending at least to lower margin of face; arista bare. Prelabrum much reduced, not prominent in profile; palpus moderately short.

Thorax elongate; mesoscutum extensively haired, humeral callus less so; scutellum almost semicircular in dorsal outline, with long but not dense dorsal hairs; mesopleuron, pteropleuron, and much of sternopleuron with numerous hairs. Femora armed as in *M. fenestra*; mid tibia with one large terminal ventral spur. Wing as in Fig. 12; membrane entirely microtrichose.

Male postabdomen. Outer surstylus moderately broad, sheathing, simple in shape, its apex very slightly exceeding that of inner surstylus, with sparse minute setulae; inner surstylus with one sharply acuminate apical prensiseta and one short compact prensiseta on anterior surface far from apex; aedeagus with simple glans, lacking sclerotized bulb and associated process; terminal filament moderately long and tapering.

Figure 13. This depiction of Dee Why, New South Wales (near Sydney), painted by Jules Pierre (Jan) De Leener (1873–1944) before urbanization of the area, shows a typical habitat for *Microepicausta* species: sandy and close to the seashore

Female postabdomen distally very slender; aculeus very small, attenuated, not dorsoventrally compressed, not tapered distally.

Dimensions. Total length, ♂ 3.5–6.0 mm, ♀ 3.9–5.4 mm; length of thorax, ♂ 1.1–1.9 mm, ♀ 1.4–2.0 mm; length of wing, ♂ 2.9–4.1 mm, ♀ 3.5–4.6 mm; length of glans of aedeagus 0.20 mm.

Distribution. East coast of Queensland and New South Wales from Bowen district southwards; Tasmania—east coast as far south as Falmouth district; South Australia—near Victor Harbour. The species is evidently restricted to sandy habitats near the sea-shore (see, for example, Dee Why before urbanization, coastal New South Wales near Sydney, early twentieth century, Fig. 13). Although we have no material from Victoria, I consider it probable that the species lives in that state.

Notes. *Microepicausta wirthi* is distinguished from other species of the genus by the extensive dense whitish pruinescence covering most of the black thoracic cuticle, and the entirely pale cephalic and thoracic bristles. The anteriorly pointed head-profile, the small eyes, and reduced prelabrum are also distinctive.

The specific epithet refers to Willis W. Wirth, formerly of the National Museum of Natural History, Washington D.C., who drew my attention to this species when visiting Australia in 1957.

Acknowledgments. John C. Martin produced the photographic illustrations. Helen M. Smith gave much help in organizing the manuscript. Daniel F. Bickel, Russel Cox and Shane F. McEvey gave general support. Names of collectors are given in the Introduction.

References

Evenhuis, N. L. 1989. 64. Family Platystomatidae. In *Catalog of the Diptera of the Australasian and Oceanian Regions,* ed. N. L. Evenhuis. *Bishop Museum Special Publication* 86: 482–497. https://doi.org/10.5962/bhl.title.49897

Hendel, F. 1914a. Diptera, Fam. Muscaridae, Subfam. Platystominae. Genera Insectorum 157: 179 pp., 15 pls.

Hendel, F. 1914b. Die Arten der Platystominen. Abhandlungen der K. K. Zool. Botan. *Gesellschaft in Wien* 8(1): 410 pp., 4 pls.

Malloch, J. R. 1928. Notes on Australian Diptera, no. xvi. *Proceedings of the Linnean Society of New South Wales* 53: 343–366.

Malloch, J. R. 1939. The Diptera of the Territory of New Guinea. VII. Family Otitidae (Ortalidae). *Proceedings of the Linnean Society of New South Wales* 64: 97–154, pls iv, v.

McAlpine, D. K. 1973. The Australian Platystomatidae (Diptera, Schizophora) with a revision of five genera. *The Australian Museum Memoir* 15: 1–256. https://doi.org/10.3853/j.0067-1967.15.1973.454

McAlpine, D. K. 2000. Australian signal flies of the genus *Rhytidortalis* (Diptera: Platystomatidae). *Proceedings of the Linnean Society of New South Wales* 121: 147–174 [Dated 1999, published 22 February 2000].

McAlpine, D .K. 2001. Review of the Australasian genera of signal flies (Diptera: Platystomatidae). *Records of the Australian Museum* 53(2): 113–199. https://doi.org/10.3853/j.0067-1975.53.2001.1327

Records of the Australian Museum (2019)
vol. 71, issue no. 3, pp. 105–110
https://doi.org/10.3853/j.2201-4349.71.2019.1713

Records of the Australian Museum
a peer-reviewed open-access journal
published by the Australian Museum, Sydney
communicating knowledge derived from our collections
ISSN 0067-1975 (print), 2201-4349 (online)

David K. McAlpine Bibliography from 1952 to the Present

Russell Cox and Shane F. McEvey

Australian Museum Research Institute,
Australian Museum, 1 William Street, Sydney NSW 2010, Australia

Abstract. A complete list of the 103 peer-reviewed publications of the Australian Museum dipterist—David K. McAlpine—is presented. This list is compiled under Dr McAlpine's oversight and has benefited from his input throughout. A separate and more complete list (157 works) is compiled as an online supplementary dataset (Cox, 2019), it includes reports, notes presented at meetings, and published newspaper or magazine pieces, many of which Dr McAlpine describes as popular or informal and lacking the scientific rigour he would normally apply.

Introduction

David Kendray McAlpine MSc, PhD, DIC, of the Australian Museum in Sydney, is one of the World's leading dipterists. He has described seven new families (Table 1), 50 new genera (Table 2) and 415 new species. From the titles of his works it can be seen that his research has embraced more than 40 dipterous families.

Having established, at the beginning of his career, a very efficient *modus operandi* for his taxonomic research and publishing, and having ready access to one of the world's most comprehensive libraries of Australian taxonomic literature—the Australian Museum Research Library—Dr McAlpine was constrained only by time. Throughout his tenure at the Australian Museum's Department of Entomology he has worked with a team of able staff—curators, field workers, illustrators (although most of his drawing are his own), librarians, SEM and microscope technicians, lab assistants, photographers, copy-editors and typists, who, under his supervision, assisted with his work. His productivity flourished during the last half century and continues to the present day.

Dr McAlpine generates output independent of—and unencumbered by—emerging digital technologies. He has, therefore, avoided the distractions of ever-changing software and digital solutions that promise efficiencies. He chose not to become a user of electric typewriters or, later, personal computers. Consequently he has no email and is not immersed in online scientific communication and information exchange despite being surrounded at the Museum by many who are. He did, never-the-less, establish good working relationships with museum staff who were expert in scanning electron microscopy and later digital photography and photo-montage technology. Despite side-stepping the digital revolution, he still, to this day, publishes high quality taxonomy at a rate few exceed and, in this respect, his work provides a noteworthy example of how much can be achieved—albeit with a support team—outside a digital work environment.

Many of the works in this bibliography (and in the supplementary dataset which is more expansive: being the present bibliography plus most of his non-peer-reviewed narratives and notes—Cox, 2019) have been digitized by the respective publishers, and in those cases or when otherwise available, links are given to the original resources online. Other material, still only available in print, is held by Dr McAlpine, or is in the Australian Museum Archives and will gradually be digitized. In the near future the AM Research

Keywords: Bibliography; Diptera; taxonomy; entomology; Australian Museum; natural history
Corresponding author: Russel Cox Russell.Cox@austmus.gov.au
Received: 14 February 2018 **Accepted**: 6 April 2018 **Published**: 12 June 2019 (in print and online simultaneously)
Publisher: The Australian Museum, Sydney, Australia (a statutory authority of, and principally funded by, the NSW State Government)
Citation: Cox, Russell, and Shane F. McEvey. 2019. David K. McAlpine bibliography from 1952 to the present. *Records of the Australian Museum* 71(3): 105–110. https://doi.org/10.3853/j.2201-4349.71.2019.1713

Library together with AM Archives is digitizing issues of the non-research serial titles, e.g., *The Australian Museum Magazine, Australian Natural History* etc. in which Dr McAlpine frequently published brief observations. Whereas the research serial titles e.g., *Records of the Australian Museum* and *Australian Museum Memoirs* etc. have already been digitized. The entire legacy of Australian Museum peer-reviewed research that has been published since 1851 is freely available online, CrossRef-DOI-registered, and searchable at https://doi.org/10.3853/issn.2201-4349

David K. McAlpine (Australia) should not be confused with the Canadian dipterist James Francis (Frank) McAlpine.

Table 1. Dipterous families discussed or studied in detail, described as new, or elevated in status, in the works of David K. McAlpine; numerous other families are drawn into his research for comparitive or contextual purposes—a list of fly families never mentioned would be small. The following four non-fly families: Agaristidae and Papilionidae (Lepidoptera), Scarabaeidae (Coleoptera), Paradiseidae (Passeriformes), and Siphonariidae (Mollusca) appear in titles of works authored by McAlpine. He also published on the plant families Ochidaceae and Myrtaceae.

Aulacigastridae	Helosciomyzidae	Pallopteridae
Canacidae	Heterocheilidae McAlpine, 1991	Periscelididae
Zaleinae McAlpine, 1985	Heteromyzidae	Perissommatidae
Chyromyidae	Ironomyiidae	Piophilidae
Clusiidae	Lauxaniidae	Platystomatidae
Coelopidae	Marginidae McAlpine, 1991	Pseudopomyzidae McAlpine, 1966
Cryptochetidae	Megamerinidae	Pyrgotidae
Ctenostylidae	Micropezidae	Rhinotoridae
Cypselosomatidae	Natalimyzidae Barraclough & McAlpine, 2006	Somatiidae
Dryomyzidae	Neminidae	Sphaeroceridae
Gobryidae McAlpine, 1997	Nemininae McAlpine, 1983	Tephritidae
Helcomyzidae	Neurochaetidae McAlpine, 1978	Teratomyzidae Colless & McAlpine, 1970
Heleomyzidae	Nothybidae	Xenasteiidae

Table 2. Dipterous genera described or discussed in detail, or genera in which new species are described, in works by McAlpine. * denotes a new name (n.nom.) for an existing taxon.

Family Canacidae
*Zalea** McAlpine, 1982

Family Clusiidae
Allometopon
Czernyola
Hendelia
Hetermeringia
Tetrameringia McAlpine, 1960

Family Coelopidae
Amma McAlpine, 1991
Gluma McAlpine, 1991
Lopa McAlpine, 1991
Rhis McAlpine, 1991
This McAlpine, 1991

Family Cryptochetidae
Librella McAlpine, 1976

Family Cypselosomatidae
Clisa McAlpine, 1993

Family Heleomyzidae
Amphidysis McAlpine, 1985
Austroleria McAlpine, 1967
Borboroides
Cairnsimyia
Dioche McAlpine, 1985
Diplogeomyza
Heleomicra McAlpine, 1985
Leriopsis McAlpine, 1967
*Nephellum** McAlpine, 1985
Ollix McAlpine, 1985
Pentachaeta McAlpine, 1985
Tapeigaster
Trixoleria McAlpine, 1967
Zentula McAlpine, 1985
Zinza McAlpine, 1995

Family Helosciomyzidae
Helosciomyza
Luta McAlpine, 2012
Neosciomyza

Family Lauxaniidae
Paranomina

Family Marginidae
Margo McAlpine, 1991

Family Micropezidae
Badisis McAlpine, 1990
Cothornobata
Crepidochetus
Metopochetus
Mimegralla
Papeza McAlpine, 1975

Family Natalimyzidae
Natalimyza Barraclough & McAlpine, 2006

Family Neminidae
Nemo McAlpine, 1983
Ningulus McAlpine, 1983

Family Neurochaetidae
Neurochaeta McAlpine, 1978
Neurocytta McAlpine, 1988
Neurotexis McAlpine, 1988
Nothoasteia

Family Platystomatidae
Achias
Aetha McAlpine, 2001
*Apiola** McAlpine, 1973
Bama McAlpine, 2001
Dayomyia McAlpine, 2007
Duomyia
Eumeka McAlpine, 2001
Euprosopia
Hysma McAlpine, 2001
Inium McAlpine, 1995
Lamprogaster
Lenophila
Mesoctenia
Microepicausta
Naupoda
Par McAlpine, 2001
Phlyax McAlpine, 2001
Plagiostenopterina
Pogonortalis
Rhytidortalis
Signa McAlpine, 2001
Sors McAlpine, 2007
Tarfa McAlpine, 2001
Terzia McAlpine, 2001
Tomeus McAlpine, 2001
Zealandortalis

Family Pseudopomyzidae
Pseudopomyza

Family Tephritidae
Phytalmia
Sessilina McAlpine & Schneider, 1978

Family Teratomyzidae
Auster McAlpine, 1994
Camur McAlpine, 1994
Lips McAlpine, 1994
Pous McAlpine, 1994
Stepta McAlpine, 1994
Teratomyza

Bibliography

This list includes only those works that are peer-reviewed. See Cox (2019) for a fuller listing that also includes McAlpine's popular writings and contributions.

Arranged by year.

McAlpine, D. 1952. Notes on some Siphonariidae (class Gastropoda). *Proceedings of the Royal Zoological Society of New South Wales* 1951–52: 40–42.
https://www.biodiversitylibrary.org/item/119483#page/42/mode/1up

McAlpine, D. K. 1958. A key to the Australian families of Acalyptrate Diptera (Insecta). *Records of the Australian Museum* 24(12): 183–190.
https://doi.org/10.3853/j.0067-1975.24.1958.650

McAlpine, D. K. 1958. A family of flies new to Australia (Diptera, Rhinotoridae). *Proceedings of the Royal Zoological Society of New South Wales* 1956–57: 64–65.
https://www.biodiversitylibrary.org/item/119462#page/66/mode/1up

McAlpine, D. K. 1960. A review of the Australian species of Clusiidae (Diptera, Acalyptrata). *Records of the Australian Museum* 25(4): 63–94.
https://doi.org/10.3853/j.0067-1975.25.1960.656

McAlpine, D. K. 1965. A new genus and species of Pallopteridae (Diptera, Schizophora) from Papua. *Proceedings of the Linnean Society of New South Wales* 89(2): 218–220. [Read 27 May 1964, dated 1964, published 1965].
https://www.biodiversitylibrary.org/item/108534#page/236/mode/1up

McAlpine, D. K. 1966. Description and biology of an Australian species of Cypselosomatidae (Diptera), with a discussion of family relationships. *Australian Journal of Zoology* 14(4): 673–685.
https://doi.org/10.1071/ZO9660673

McAlpine, D. K. 1967. The Australian species of *Diplogeomyza* and allied genera (Diptera, Heleomyzidae). *Proceedings of the Linnean Society of New South Wales* 92(1): 74–106.
https://www.biodiversitylibrary.org/item/221241#page/88/mode/1up

McAlpine, D. K. 1968. The genus *Cairnsimyia* Malloch (Diptera, Heleomyzidae, Rhinotorini). *Records of the Australian Museum* 27(12): 263–283.
https://doi.org/10.3853/j.0067-1975.27.1968.446

Colless, D. H., and D. K. McAlpine. 1970. Chapter 34. Diptera (Flies). In *The Insects of Australia,* pp. 656–740. Melbourne: Melbourne University Press.

McAlpine, D. K. 1970. A note on the status of *Ornithoptera allottei* (Rothschild) (Lepidoptera: Papilionidae). *Journal of the Australian Entomological Society* 9(3): 233–234.
https://doi.org/10.1111/j.1440-6055.1970.tb00797.x

McAlpine, D. K. 1971. Status and synonymy of the genus *Craspedochaeta* Czerny (Diptera: Clusiidae). *Journal of the Australian Entomological Society* 10(2): 121–122.
https://doi.org/10.1111/j.1440-6055.1971.tb00019.x

McAlpine, D. K. 1972. A note on the Christmas Beetle *Trioplognathus griseopilosus* (Coleoptera, Rutelinae). *Australian Entomological Magazine* 1(1): 14.

McAlpine, D. K. 1972. The meaning and practical application of the species concept. *Australian Entomological Magazine* 1(2): 7–12.

McAlpine, D. K. 1973. The Australian Platystomatidae (Diptera, Schizophora) with a revision of five genera. *Australian Museum Memoir* 15: 1–256.
https://doi.org/10.3853/j.0067-1967.15.1973.454

McAlpine, D. K. 1973. Observations on sexual behaviour in some Australian Platystomatidae (Diptera, Schizophora). *Records of the Australian Museum* 29(1): 1–10.
https://doi.org/10.3853/j.0067-1975.29.1973.235

McAlpine, D. K. 1974. Some field observations on *Nothybus* (Diptera, Nothybidae). *Australian Entomological Magazine* 1(6): 89–91.

Steyskal, G. C., and D. K. McAlpine. 1974. Platystomatidae Schiner, 1882: proposed conservation as a family-group name over Achiidae Fleming, 1821 (Insecta, Diptera). Z. N. (S.) 2053. *Bulletin of Zoological Nomenclature* 31(1): 59–61.

McAlpine, D. K. 1975. The subfamily classification of the Micropezidae and the genera of Eurybatinae (Diptera: Schizophora). *Journal of Entomology* (B) 43(2): 231–245. [Dated 1974, published 1975.]

Colless, D. H. and D. K. McAlpine 1975. Chapter 34. Diptera. *The Insects of Australia. Supplement 1974*. Melbourne: Melbourne University Press, pp. 91–96, 132–133.

McAlpine, D. K. 1975. Combat between males of *Pogonortalis doclea* (Diptera, Platystomatidae) and its relation to structural modification. *Australian Entomological Magazine* 2(5): 104–107.

McAlpine, D. K. 1976. A new genus of flies possibly referable to Cryptochetidae (Diptera, Schizophora). *Australian Entomological Magazine* 3(3): 45–56.

McAlpine, D. K. 1976. Spiral vibrissae in some clusiid flies (Diptera, Schizophora). *Australian Entomological Magazine* 3(4): 75–78.

McAlpine, D. K., and S. P. Kim. 1977. The genus *Lenophila* (Diptera: Platystomatidae). *Records of the Australian Museum* 30(13): 309–336.
https://doi.org/10.3853/j.0067-1975.30.1977.391

McAlpine, D. K., and M. A. Schneider. 1978. A systematic study of *Phytalmia* (Diptera, Tephritidae) with description of a new genus. *Systematic Entomology* 3(2): 159–175.
https://doi.org/10.1111/j.1365-3113.1978.tb00112.x

McAlpine, D. K. 1978. Notes on nomenclature and type-specimens of Australian Pyrgotidae (Diptera, Schizophora). *Australian Entomological Magazine* 5(2): 27–33.

McAlpine, D. K. 1978. Description and biology of a new genus of flies related to *Anthoclusia* and representing a new family (Diptera, Schizophora, Neurochaetidae). *Annals of the Natal Museum* 23(2): 273–295.

McAlpine, D. K. 1978. A new species of Cypselosomatidae from Lord Howe Island (Diptera, Micropezoidea). *Australian Entomological Magazine* 5(4): 61–64.

McAlpine, D. K. 1979. The correct name and authorship for Wallace's Standard Wing (Passeriformes, Paradiseidae). *The Bulletin of the British Ornithologists' Club* 99(3): 108–110.

McAlpine, D. K. 1979. Agonistic behaviour in *Achias australis* (Diptera, Platystomatidae) and the significance of eye stalks. In *Sexual Selection and Reproductive Competition in Insects*, ed. M. S. and N. A. Blum, pp. 221–230. New York: Academic Press.

Schneider, M. A., and D. K. McAlpine. 1979. Three new species of acalyptrate flies (Diptera: Lauxaniidae and Platystomatidae) from Norfolk Island. *Australian Entomological Magazine* 6(4): 69–73.

McAlpine, D. K. 1981. Food plant record for *Cruria donowani* (Boisduval) (Lepidoptera: Agaristidae). *Australian Entomological Magazine* 7(6): 84.

McAlpine, D. K. 1981. Acalyptrate flies. In *Lord Howe Island: a summary of current and projected scientific and environmental activities,* ed. H. F. Recher and W. F. Ponder, p. 21. *Occasional Reports of the Australian Museum* 1: 1–72.
https://doi.org/10.3853/isbn.0-7240-2060-8

McAlpine, D. K. 1982. The acalyptrate Diptera with special reference to the Platystomatidae. In *Biogeography and Ecology of New Guinea,* ed. J. L. Gressitt, volume 2, pp. 659–673. The Hague: W. Junk.

McAlpine, D. K. 1982. A new genus of Australian littoral flies (Diptera: ?Canacidae). *Memoirs of the Entomological Society of Washington* 10: 108–117.

McAlpine, D. K., and D. S. Kent. 1982. Systematics of *Tapeigaster* (Diptera, Heleomyzidae) with notes on biology and larval morphology. *Proceedings of the Linnean Society of New South Wales* 106(1): 33–58.
https://www.biodiversitylibrary.org/item/108660#page/55/mode/1up

McAlpine, D. K. 1983. A new subfamily of Aulacigastridae (Diptera: Schizophora), with a discussion of aulacigastrid classification. *Australian Journal of Zoology* 31(1): 55–78.
https://doi.org/10.1071/ZO9820055

McAlpine, D. K. 1984. The species of *Pseudoleria* introduced into Australia (Diptera, Heleomyzidae). *General and Applied Entomology* 16: 45–48.

Shuter, E., and D. K. McAlpine. 1985. First larvae of Teratomyzidae (Diptera). *Australian Entomological Society News Bulletin* 21(1): 26.

McAlpine, D. K. 1985. Taxonomic notes on the genus *Zale* McAlpine (Diptera: Canacidae). *Australian Entomological Magazine* 11(6): 81–82.

McAlpine, D. K. 1985. The Australian genera of Heleomyzidae (Diptera: Schizophora) and a reclassification of the family into tribes. *Records of the Australian Museum* 36(5): 203–251.
https://doi.org/10.3853/j.0067-1975.36.1985.346

McAlpine, D. K. 1985. A new species of Aulacigastridae from Papua New Guinea and characterisation of species groups in the genus *Nemo* (Diptera, Schizophora). *Australian Entomological Magazine* 12(3,4): 47–50.

McAlpine, D. K. 1987. Note on aerial swarming of *Perissomma* (Diptera: Perissommatidae). *Australian Entomological Magazine* 14(1,2): 29–30.

McAlpine, D. K. 1987. Upside-down flies. Their history and natural history. *Australian Zoologist* 23(4): 53–55.
https://doi.org/10.7882/AZ.1987.002

McAlpine, D. K. 1988. Studies in upside-down flies (Diptera: Neurochaetidae). Part 1. Systematics and phylogeny. *Proceedings of the Linnean Society of New South Wales* 110: 31–58.
https://www.biodiversitylibrary.org/item/109068#page/39/mode/1up

McAlpine, D. K. 1988. Studies in upside-down flies (Diptera: Neurochaetidae). Part II. Biology, adaptations, and specific mating mechanisms. *Proceedings of the Linnean Society of New South Wales* 110: 59–82.
https://www.biodiversitylibrary.org/item/109068#page/67/mode/1up

McAlpine, D. K. 1989. A synopsis of the Australian Piophilidae (Diptera: Schizophora). *General and Applied Entomology* 21: 17–24.

McAlpine, D. K. 1990. A new apterous micropezid fly (Diptera: Schizophora) from Western Australia. *Systematic Entomology* 15(1): 81–86.
https://doi.org/10.1111/j.1365-3113.1990.tb00305.x

McAlpine, D. K. 1990. The taxonomic position of the Ctenostylidae (= Lochmostyliinae; Diptera: Schizophora). *Memorias do Instituto Oswaldo Cruz* 84 (Supl. IV): 365–371.

McAlpine, D. K. 1991. Review of the Australian kelp flies (Diptera: Coelopidae). *Systematic Entomology* 16(1): 29–84.
https://doi.org/10.1111/j.1365-3113.1991.tb00573.x

Colless, D. H., and D. K. McAlpine. 1991. Chapter 39. Diptera (Flies). In *The Insects of Australia,* 2nd edition, CSIRO (editorial authority), pp. 717–786. Melbourne: Melbourne University Press.

McAlpine, D. K. 1991. Marginidae, a new Afrotropical family of Diptera (Schizophora: ?Opomyzoidea). *Annals of the Natal Museum* 32(1): 167–177.
https://journals.co.za/content/annals/32/1/AJA03040798_319

McAlpine, D. K. 1991. Relationships of the genus *Heterocheila* (Diptera: Sciomyzoidea) with description of a new family. *Tijschrift voor Entomologie* 134: 193–199.
https://www.biodiversitylibrary.org/item/89705#page/203/mode/1up

McAlpine, D. K. 1992. The earliest described species of Helosciomyzidae (Diptera: Schizophora). *Australian Entomological Magazine* 19(3): 89–92.

McAlpine, D. K. 1993. Review of the upside-down flies (Diptera: Neurochaetidae) of Madagascar and Africa, and evolution of neurochaetid host plant associations. *Records of the Australian Museum* 45(2): 221–239.
https://doi.org/10.3853/j.0067-1975.45.1993.21

McAlpine, D. K. 1994. A new genus of cypselosomatid flies (Diptera: Nerioidea). *General and Applied Entomology* 25: 2–4.

Colless, D. H., and D. K. McAlpine. 1994. Chapter 39. Diptera (Flies). In *Systematic and Applied Entomology,* ed. I. D. Naumann, pp. 374–387. Melbourne: Melbourne University Press.

McAlpine, D. K. 1994. Review of the species of *Achias* (Diptera: Platystomatidae). *Invertebrate Taxonomy* 8: 117–281.
https://doi.org/10.1071/IT9940117

McAlpine, D. K. 1994. A new Australian species of pseudopomyzid fly (Diptera: Nerioidea) and the subgenera of *Pseudopomyza*. *Proceedings of the Linnean Society of New South Wales* 114(4): 181–187.
https://www.biodiversitylibrary.org/item/108593#page/193/mode/1up

McAlpine, D. K., and R. G. de Keyzer. 1994. Generic classification of the fern flies (Diptera: Teratomyzidae) with a larval description. *Systematic Entomology* 19(4): 305–326.
https://doi.org/10.1111/j.1365-3113.1994.tb00593.x

McAlpine, D. K. 1995. Critical review of Australasian records of dryomyzid flies and resultant new combinations and synonymy in Lauxaniidae and Platystomatidae (Diptera: Schizophora). *General and Applied Entomology* 26: 41–43.

McAlpine, D. K. 1995. *Inium*, a new Australian genus of Platystomatidae (Diptera: Schizophora) apparently mimicking ants. *Beiträge zur Entomologie* 45(2): 251–259.

Sinclair, B. J., and D. K. McAlpine. 1995. *Zinza*, a new genus of rhinotorine flies from northern Queensland, Australia (Diptera: Heleomyzidae). *Records of the Australian Museum* 47(3): 225–230.
https://doi.org/10.3853/j.0067-1975.47.1995.238

McAlpine, D. K. 1996. Relationships and classification of the Pseudopomyzidae (Diptera: Nerioidea). *Proceedings of the Linnean Society of New South Wales* 116: 223–232.
https://www.biodiversitylibrary.org/item/108623#page/227/mode/1up

McAlpine, D. K. 1997. Relationships of the Megamerinidae (Diptera: Nerioidea). *Beiträge zur Entomologie* 47(2): 465–475.

McAlpine, D. K. 1997. Gobryidae, a new family of acalyptrate flies (Diptera: Diopsoidea), with a discussion of relationships of the diopsoid families. *Records of the Australian Museum* 49(2): 167–194.
https://doi.org/10.3853/j.0067-1975.49.1997.1264

McAlpine, D. K. 1998. Review of the Australian stilt flies (Diptera: Micropezidae) with a phylogenetic analysis of the family. *Invertebrate Taxonomy* 12: 55–134.
https://doi.org/10.1071/IT96018

McAlpine, D. K. 1998. Key to the families of Acalyptrate. Micropezidae. Pseudopomyzidae. Gobryidae. Megamerinidae. Ctenostylidae. Platystomatidae. Coelopidae. Dryomyzidae. Neminidae. Aulacigastridae. Periscelididae. Neurochaetidae. Teratomyzidae. Xenasteiidae. Heleomyzidae. Chyromyidae. In *The Families of Diptera of the Malay Archipelago*, ed. P. Oosterbroek, pp. 48–60, 103–104, 105, 107–108, 110–113, 118–119, 123–127, 132–133. Leiden: Brill.

McAlpine, D. K. 1999. 3.7. Family Cypselosomatidae. In *Contributions to a Manual of Palaearctic Diptera,* ed. L. Papp and B. Darvas, volume 3, pp. 151–154. Budapest: Science Herald.

McAlpine, D. K., and A. I. Shatalkin. 1999. 3.8. Family Pseudopomyzidae. In *Contributions to a Manual of Palaearctic Diptera,* ed. L. Papp and B. Darvas, volume 3, pp. 155–163. Budapest: Science Herald.

McAlpine, D. K. 1999. 3.13. Family Platystomatidae. In *Contributions to a Manual of Palaearctic Diptera,* ed. L. Papp and B. Darvas, volume 3, pp. 193–199. Budapest: Science Herald.

McAlpine, D. K. 1999. 3.30. Family Teratomyzidae. In *Contributions to a Manual of Palaearctic Diptera,* ed. L. Papp and B. Darvas, volume 3, pp. 331–334. Budapest: Science Herald.

McAlpine, D. K. 1999. 3.31. Family Coelopidae. In *Contributions to a Manual of Palaearctic Diptera,* ed. L. Papp and B. Darvas, volume 3, pp. 335–340. Budapest: Science Herald.

McAlpine, D. K. 1999. 3.32. Family Helcomyzidae. In *Contributions to a Manual of Palaearctic Diptera,* ed. L. Papp and B. Darvas, volume 3, pp. 341–344. Budapest: Science Herald.

McAlpine, D. K. 1999. 3.33. Family Heterocheilidae. In *Contributions to a Manual of Palaearctic Diptera,* ed. L. Papp and B. Darvas, volume 3, pp. 345–347. Budapest: Science Herald.

McAlpine, D. K. 2000. Australian signal flies of the genus *Rhytidortalis* (Diptera: Platystomatidae). *Proceedings of the Linnean Society of New South Wales* 121: 147–174 [Dated 1999, published 22 February 2000].
https://www.biodiversitylibrary.org/item/108642#page/157/mode/1up

McAlpine, D. K. 2001. Review of the Australasian genera of signal flies (Diptera: Platystomatidae). *Records of the Australian Museum* 53(2): 113–199.
https://doi.org/10.3853/j.0067-1975.53.2001.1327

McAlpine, D. K. 2002. Some examples of reduced segmentation of the arista in Diptera-Cyclorrhapha, and some phylogenetic implications. *Studia dipterologica* 9(1): 3–19.
http://www.studia-dipt.de/con91.htm

Hamilton, J. R., D. K. Yeates, A. Hastings, D. H. Colless, D. K. McAlpine, D. Bickel, P. S. Cranston, M. A. Schneider, G. Daniels, and S. Marshall. 2006. *On The Fly: The Interactive Atlas and Key to Australian Fly Families*. (CD ROM). Australian Biological Resources Study, and Centre for Biological Information Technology (CBIT).

Barraclough, D. A., and D. K. McAlpine. 2006. Natalimyzidae, a new African family of acalyptrate flies (Diptera: Schizophora: Sciomyzoidea). *African Invertebrates* 47: 117–134.

McAlpine, D. K. 2007. The surge flies (Diptera: Canacidae: Zaleinae) of Australasia and notes on tethinid-canacid morphology and relationships. *Records of the Australian Museum* 59(1): 27–64.
https://doi.org/10.3853/j.0067-1975.59.2007.1468

McAlpine, D. K. 2007. New taxa of signal flies (Diptera: Platystomatidae) of New Caledonia. *Records of the Australian Museum* 59(1): 65–77.
https://doi.org./10.3853/j.0067-1975.59.2007.1485

McAlpine, D. K. 2007. Australian signal flies of the *Euprosopia megastigma* group (Diptera: Platystomatidae). *Tijdschrift voor Entomologie* 150: 219–235.
https://doi.org/10.1163/22119434-900000223

McAlpine, D. K. 2007. Review of the Borboroidini or wombat flies (Diptera: Heteromyzidae), with reconsideration of the status of families Heleomyzidae and Sphaeroceridae, and descriptions of femoral gland-baskets. *Records of the Australian Museum* 59(3): 143–219.
https://doi.org/10.3853/j.0067-1975.59.2007.1487

McAlpine, D. K. 2008. New extant species of ironic flies (Diptera: Ironomyiidae) with notes on ironomyiid morphology and relationships. *Proceedings of the Linnean Society of New South Wales* 129: 17–38.
https://www.biodiversitylibrary.org/item/110727#page/561/mode/1up

Dhang, C. C., H. C. Chin, D. K. McAlpine, H. Kurahashi, N. W. Ahmad, M. A. Marwi, J. Jeffery, L. H. Lim, B. Omar, and M. Sofian-Azirun. 2008. First report of the signal fly, *Scholastes* sp. (Diptera: Platystomatidae) visiting animal carcasses in Malaysia. *Tropical Biomedicine* 25(3): 264–266.
https://drive.google.com/file/d/0B75lcx0mfp2ONnc5Vm9TY1F5LWc/view

Yeates, D. K., D. Bickel, D. K. McAlpine, and D. H. Colless. 2009. Chapter 8. Diversity, relationships and biogeography of Australian flies. In *Diptera Diversity: Status, Challenges and Tools*, ed. T. Pape, D. Bickel, and R. Meier, pp. 227–256. Leiden: Brill.

Buck, M., and D. K. McAlpine. 2010. Chapter 57. Family Pseudopomyzidae (Pseudopomyzid flies). *Manual of Central American Diptera*. Volume 2: 821–825. Ottawa: NRC Research Press.

Lonsdale, O., and D. K. McAlpine. 2010. Chapter 59. Family Somatiidae (Somatiid flies). *Manual of Central American Diptera*. Volume 2: 833–835. Ottawa: NRC Research Press.

McAlpine, D. K., and N. E. Woodley. 2010. Chapter 94. Family Heleomyzidae (Heleomyzid flies). *Manual of Central American Diptera*. Volume 2: 1159–1164. Ottawa: NRC Research Press.

McAlpine, D. K. 2011. Queensland signal flies of the *Duomyia ameniina* alliance (Diptera: Platystomatidae) and a related new species. *Tijdschrift voor Entomologie* 154: 61–73.
https://doi.org/10.1163/22119434-900000308

Mathis, W. N., and D. K. McAlpine. 2011. A catalogue and conspectus on the family Coelopidae (Diptera: Schizophora). *Myia* 12: 171–201. Sofia: Pensoft Publishers.

McAlpine, D. K. 2011. Observations on antennal morphology in Diptera, with particular reference to the articular surfaces between segments 2 and 3 in the Cyclorrhapha. *Records of the Australian Museum* 63(2): 113–166.
https://doi.org/10.3853/j.0067-1975.63.2011.1585

McAlpine, D. K. 2011. The clawless upside-down fly, *Nothoasteia clausa* (Diptera: Neurochaetidae): notes on distribution, behaviour, and comparative morphology. *Tijdschrift voor Entomologie* 154: 159–165.

McAlpine, D. K. 2012. Notes and descriptions of Australian Helosciomyzidae or comb-winged flies (Diptera: Schizophora). *Records of the Australian Museum* 64(1): 51–70.
https://doi.org/10.3853/j.0067-1975.64.2012.1582

McAlpine, D. K. 2012. Fern flies of Australia: the genus *Teratomyza* s.l. (Diptera: Teratomyzidae). *Australian Entomologist* 39(4): 293–304.

McAlpine, D. K. 2012. Signal flies of the genus *Duomyia* (Diptera: Platystomatidae) in the Northern Territory, Australia. *Records of the Australian Museum* 64(2): 121–148.
https://doi.org/10.3853/j.0067-1975.64.2012.1587

McAlpine, D. K. 2013. Supplementary descriptions of Australian Rhinotorini (Diptera: Heteromyzidae). *Zootaxa* 3680(1): 130–138.
https://doi.org/10.11646/zootaxa.3680.1.9

McAlpine, D. K. 2014. Review of the Australian genus *Pentachaeta* (Diptera: Heleomyzidae), with descriptions of nine new species. *Records of the Australian Museum* 66(5): 247–264.
https://doi.org/10.3853/j.2201-4349.66.2014.1631

McAlpine, D. K. 2015. Signal flies of the genus *Bama* (Diptera: Platystomatidae) in Papua New Guinea. *Records of the Australian Museum* 67(2): 25–53.
https://doi.org/10.3853/j.2201-4349.67.2015.1603

McAlpine, D. K. 2019. Review of the species of *Paranomina* (Diptera: Lauxaniidae). *Records of the Australian Museum* 71(3): 71–85.
https://doi.org/10.3853/j.2201-4349.71.2019.1655

McAlpine, D. K. 2019. The genus *Pseudopomyza* (Diptera: Nerioidea) in Tasmania, with description of a new species. *Records of the Australian Museum* 71(3): 87–94.
https://doi.org/10.3853/j.2201-4349.71.2019.1674

McAlpine, D. K. 2019. Review of the Australian signal flies of the genus Microepicausta (Diptera: Platystomatidae). *Records of the Australian Museum* 71(3): 95–104.
https://doi.org/10.3853/j.2201-4349.71.2019.1675

Biographical note. Born in Sydney in 1934, D. K. McAlpine spent his early childhood at Gloucester until 1937 then Bellingen, New South Wales. Educated Sydney Grammar School (1945–1950); B.Sc. (Hons.) in zoology, University of Sydney, 1954; M.Sc. in zoology, University of Sydney, 1958; Ph.D. in entomology, Imperial College, University of London, 1969; Diploma, Imperial College, 1970; also studied at the Natural History Museum, London. Science trainee ["cadet"] in Entomology at the Australian Museum 1952–1955, Assistant Curator in Entomology, 1955–1967, Research Scientist, 1970–, Senior Research Scientist, 1978–1986, Principal Research Scientist, 1986 until retirement in December 1994. Research Fellow of the Australian Museum 1994 to the present (Anon., 1955, 1972; Daniels, 2004). The Editor of the Australian Museum's *Explore* magazine interviewed Dr McAlpine in 2015 (Atkins, 2015); various anecdotes were recollected—Atkins writes: "He's surprised that his 60th anniversary [working at the Australian Museum] seems to have escaped his attention ..."

References

Anonymous. 1955. Notes and news. *Australian Museum Magazine* 11(11): 374.*

Anonymous. 1972. Meet our contributors ... . *Australian Natural History* 17(8): 284.*

Atkins, Brendan. 2015. Flying under the radar. *Explore* 37(2): 14–16. *

Cox, R. 2019. A complete bibliography of David K. McAlpine. *figshare*
https://doi.org/10.6084/m9.figshare.8195507

Daniels, G. 2004. *Bibliography of Australian Entomology 1687–2000*, volumes 1 and 2, pp. xii+1776. Published by Greg Daniels: Mount Ommaney, Queensland, Australia.

* Many of the popular (not peer-reviewed) works published by McAlpine in *Australian Museum Magazine, Australian Natural History, Explore* [Australian Museum], *Search, Circular of the Entomological Society of New South Wales, Australian Entomological Society News Bulletin, The Orchadian* etc. are either digitized and online but not yet DOI-registered or are not yet available digitally. The authors have compiled a complete list of all such publications—including all the peer-reviewed works—and published this separately as an online dataset so that edits may be made and links inserted as appropriate in future (see Cox, 2019).

INSTRUCTIONS TO AUTHORS

[illegible]

Australian Museum Research Institute
1 William Street, Sydney NSW 2010
scientific publications freely accessible at
https://doi.org/10.3853/issn.2201-4349
ISSN 0067-1975 (print) 2201-4349 (online)